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The Role of Client Avoidance on PTSD Recovery throughout the Course of Trauma Therapy

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Abstract

The accumulation of randomized controlled trials (RCTs) for the treatment of posttraumatic stress disorder (PTSD) over the past few decades has contributed to the development of clinical treatment guidelines (Chambless & Ollendick, 2001; Forbes et al., 2010; Truax & Thomas, 2003). Two treatments that have gained substantial support are Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT). Although these treatments result in most participants losing their PTSD diagnosis and obtaining meaningful reductions in symptoms, some clients remain refractory to treatment. Researchers have worked to identify predictors of treatment outcome, but have given minimal attention to aspects of client avoidance as process variables that could impact recovery. The current paper evaluates the role of client avoidance process variables on PTSD treatment outcome. Using therapy session tapes and client chart files for 70 participants who underwent CPT in two NIH-funded trials, the role of in-session avoidance, homework noncompliance, and irregular attendance were evaluated. Among in-session avoidance variables, greater avoidance of the trauma memory was negatively correlated with a reduction in posttraumatic symptoms. However, due to lack of variability in in-session engagement variables, few meaningful correlations were obtained for other in-session avoidance variables and PTSD and depression treatment outcome. Among the homework variables, perceived helpfulness of homework among completers was the only significant predictor of PTSD symptom change. Finally, attendance compliance and irregular session attendance did not significantly predict PTSD and depression change scores. Implications of these findings are discussed.

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Therapy

The accumulation of randomized controlled trials (RCTs) over the past few decades has contributed to the development of clinical treatment guidelines (Chambless & Ollendick, 2001; Forbes et al., 2010; Truax & Thomas, 2003). Although controversy exists over the utilization of these guidelines (Chambless & Ollendick, 2001), they benefit clinicians by providing information about evidence based treatment practices (EBPs) for various mental disorders (Durand & Wang, 2011). Often, these guidelines include cognitive behavioral treatments (Chambless & Ollendick, 2001; Kazdin, 2003), due to this orientation's strong emphasis on empiricism (Association for Behavioral and Cognitive Therapies, 2013).

Researchers have devoted attention to cognitive behavioral treatments (CBTs) for a number of clinical diagnoses (Butler, Chapman, Forman & Beck, 2006), including Posttraumatic Stress Disorder (PTSD; American Psychiatric Association, 2013). This research has yielded several evidence-based treatments (Forbes, et al., 2010) that are efficacious in treating clients suffering from this disorder. Among the PTSD treatments deemed evidence-based, Prolonged Exposure (PE; Foa, Hembree & Rothbaum, 2007; Foa & Rothbaum, 1998; Foa, Rothbaum, Riggs, & Murdock, 1991) and Cognitive Processing Therapy (CPT; Resick, Monson & Chard, 2008; Resick & Schnicke, 1992) are two of the interventions that have garnered substantial empirical support (Foa, Keane, Friedman & Cohen, 2008) and are currently undergoing dissemination on a national level (U.S. Department of Veterans Affairs, 2013).

Despite the overall success of PE and CPT reported in the treatment outcome literature, studies show that treatment response is variable (e.g., Bradley, Green, Russ, Dutra & Westen, 2005; Cahill & Foa, 2004; Galovski, Blain, Mott, Elwood & Houle, 2012). Although many clients benefit from these treatments, roughly one-third of participants are considered "non-responders" following a full course of trauma-focused therapy (Bradley et al., 2005). However, the percentage of non-responders in a sample depends upon the definition that researchers employ to define treatment response (Bradley, et al., 2005). Some analyze diagnostic change, measured by the percentage of clients who lose their PTSD diagnosis (i.e., their number or severity of symptoms fall below the diagnostic cut-off) by the end of treatment. Alternatively, treatment response is sometimes determined by assessing clinically meaningful symptom reduction. Researchers vary in how they define "meaningful," but some use change scores from self-report measure scores as an indicator of meaningful improvement (Bradley, et al., 2005). Regardless of the criterion used to determine non-responsiveness, a number of clients remain refractory to treatment; thus, researchers have also recently sought to identify predictors of nonresponse (e.g., trauma severity, social support, depression, anger, guilt, comorbidity; Schottenbauer, Glass, Arnkoff, Tendick & Gray, 2008).

However, despite the fact that the development of EBPs and the identification of non-response predictor variables have helped to advance the field's understanding of treatment for PTSD, questions remain. Specifically, the role of client process variables in contributing to overall treatment outcome warrants further attention (van Minnen & Hagenaars, 2002). By identifying individual variables related to treatment outcome, psychologists can work to enhance PTSD interventions, making them even more

effective for a greater number of trauma survivors. This paper seeks to evaluate the role of an important client variable, namely, the ability to break through the avoidance inherent in a diagnosis of PTSD, in treatment outcome.

Avoidance in PTSD

The majority of the information that we have about of PTSD comes from research using the Diagnostic and Statistical Manual of Mental Disorders-4th edition-Text Revision (DSM-IV-TR; APA, 2000) criteria. Yet, with the transition to the fifth version of the DSM (DSM-V; APA, 2013), the conceptualization of avoidance has changed, and will be discussed below. Because avoidance is inherently involved in a PTSD diagnosis, individuals living with PTSD symptoms often engage in a number of strategies to evade the memory of the traumatic event. Among the 17 symptoms of PTSD that are listed in the DSM-IV, seven of these symptoms (i.e., avoidance of thoughts, feelings, conversations; avoidance of people, places, activities; difficulties remembering aspects of the event; decreased interest in activities; detachment from others; numbing; and sense of foreshortened future) are allocated to the avoidance cluster. Thus, there is no question that avoidance is a central, if not a hallmark, component of a PTSD diagnosis. Due to the fact that avoidance plays such a prominent role in this diagnosis, PE and CPT aim to break through avoidance within and between sessions. These treatments utilize information processing theory and cognitive theory to conceptualize the role of avoidance within this disorder.

Information Processing Theory. Information processing theory for PTSD was originally developed by Foa, Steketee and Rothbaum (1989) as an extension of Lang's bioinformational theory of emotion (1977, 1979). Lang's theory proposes that fear

consists of a memory structure containing the feared stimulus, ascribed meaning, and response. Foa and Kozak (1986) augmented this fear network theory to PTSD (Foa & Kozak, 1986). The theory suggests that after a traumatic event, people tend to generalize the meaning of danger to innocuous stimuli. Because stimuli are linked together schematically within the fear network, whenever one stimulus is encountered, other related stimuli also become activated. Thus, numerous stimuli are perceived as dangerous, and the fear network becomes expansive and both easily and frequently triggered. When the fear network is activated, people perceive the trauma memory as dangerous and engage in avoidance behaviors in an attempt to stop thinking about the event or feeling emotions related to the reminders. Thus, they do not alter their appraisal or understanding of the traumatic event (Ehlers & Clark, 2000). Additionally, the avoidance of the trauma memory prohibits emotional engagement with the memory. This reduction in unpleasant emotions is negatively reinforced (Foa & Jaycox, 1999), leading to the maintenance of PTSD (Foa & Kozak, 1986). However, if trauma survivors engage cognitively and emotionally with the memory of the event, their distorted thoughts become less rigid, and their fear eventually habituates. This leads to the creation of a new network that includes the feared stimuli, but no longer associates a danger meaning and escape response (Foa & McNally, 1996).

According to information processing theory, if individuals avoid their trauma memories, they will not have the opportunity to activate the fear network to habituate their fear, nor alter the meaning of the memory by gaining information that is inconsistent with their fear network (Foa & Kozak, 1986).

Cognitive Theory. Cognitive theory also explains avoidance among people with a diagnosis of PTSD. This theory purports that people develop schemas about the self, others, and the world, which affect their emotions and behaviors (Resick, et al., 2008; Resick & Schnicke, 1992). Prior to a traumatic event, people have existing schemas, but in the aftermath of a trauma, these beliefs can be altered. Specifically, cognitive theory posits that there are three possible modifications of thinking after a traumatic event: assimilation, over-accommodation, and accommodation. Assimilation occurs when people amend their beliefs by changing the way they remember the event so that it fits their prior schemas (e.g., "I must have led him on so it was not really a rape"). Moreover, when someone changes their prior existing beliefs to become more extreme, this is over-accommodation (e.g., "All men are dangerous"). Accommodation occurs when people fit new information into their pre-existing schemas in a balanced manner (e.g., "Some men are dangerous, but most are not"); this the healthy and balanced cognitive modification. Given that cognitions relate to emotions, cognitive theory emphasizes the need to focus on emotions and differentiate between healthy emotions and maladaptive emotions (Resick, et al., 2008; Resick & Schnicke, 1992). The emotions that are a spontaneous reaction to the event are considered natural, primary emotions (e.g., sadness, fear, anger), whereas manufactured, or secondary emotions (e.g., guilt, shame, embarrassment) are based on cognitive interpretations. Cognitive theory maintains that for the intensity of natural affect to diminish over time, natural emotions should be experienced. Additionally, distorted assimilated and over-accommodated beliefs should be corrected. With the development of more balanced cognitions, manufactured emotions should decrease (Resick, et al., 2008; Resick & Schnicke, 1992). Overall, the experience of

natural affect and creation of accommodated thoughts contribute to the trauma recovery process.

As with information processing theory, cognitive theory asserts that people with PTSD need to overcome their avoidance strategies in order for recovery to occur. When individuals avoid the memory of the trauma, they will neither have the opportunity to allow their natural affect to decrease, nor to modify assimilated and over-accommodated beliefs that would result in diminished manufactured emotions (Resick, et al., 2008; Resick & Schnicke, 1992). Therefore, one can see that avoidance plays a key role in hindering trauma recovery.

Patient Avoidance throughout the Process of Therapy

It would benefit clinicians to understand how client avoidance throughout the course of therapy affects recovery. While research is beginning to assess the influence of therapists' skills in addressing client avoidance, and finding that therapist effectiveness in handling client avoidance is linked to CPT treatment outcome (Laska, Smith, Wislocki, Minami, & Wampold, 2013), client avoidance specifically as a process variable has received far less attention. It would be advantageous to gain an understanding of client avoidance and the ability to break through avoidance as a process variable within therapy sessions. Yet, attention has typically been paid to resolution of avoidance as an outcome variable (e.g., Taylor, Thordarson, Maxfield, Federoff, Lovell & Ogrodniczuk, 2003).

Because avoidance is both a symptom of PTSD and inherently involved in the process of maintaining posttraumatic symptoms, PE and CPT treatment protocols both provide psychoeducation during the initial phase of therapy to inform clients about how PTSD develops and the ways in which it is maintained (Foa, et al., 2007; Foa &

Rothbaum, 1998; Foa, et al., 1991; Resick, et al., 2008; Resick & Schnicke, 1992). Both of these protocols underscore the importance of clients engaging with the trauma memory within each session, as well as between sessions. Although both treatments emphasize bringing an end to avoidance, they have different proposed mechanisms of action for accomplishing this and fostering change.

Consistent with information processing theory, the PE protocol targets avoidance by having the clients directly engage with the specific details of the memory and, subsequently, habituate their fear of the memory (Foa & Rothbaum, 1998). PE clinicians are instructed to advise clients to repeatedly talk about the traumatic event in as much detail as possible during each imaginal exposure (Foa, et al., 1997; Foa & Rothbaum, 1998; Foa, et al., 1991). When they notice that a client may be avoiding details, they ask questions about the event to intensify engagement with the memory. Additionally, they have clients discuss the worst parts, or "hot spots" of the event in detail, repeatedly, until their fear habituates (Foa, et al., 1997; Foa & Rothbaum, 1998; Foa, et al., 1991).

Consistent with cognitive theory, CPT aims to break through avoidance by encouraging the client to engage with the trauma memory through discussion of the meaning of the traumatic event, as well as identification and modification of assimilated and over-accommodated beliefs (Resick, et al., 2008; Resick & Schnicke, 1992). CPT clinicians are trained to ask Socratic questions that elicit client maladaptive beliefs so that, when clients try to avoid, the questions promote engagement with the memory (Resick, et al., 2008; Resick & Schnicke, 1992). Therapists implementing this protocol also are instructed to repeatedly encourage the client to experience natural affect (Resick,

et al., 2008; Resick & Schnicke, 1992), especially when it appears that the client is avoiding the memory through the numbing of emotions.

Despite the emphasis on breaking through avoidance within these treatment protocols, a focus on the client's actual ability to engage in the trauma memory within and between sessions throughout treatment has been less well attended to in the literature. This paper specifically evaluates the role of three types of client avoidance throughout the process of therapy.

In-Session Trauma Engagement. The recent publication of the DSM-V (APA, 2013) brought about changes to the previous conceptualization of avoidance within trauma survivors. Historically, emotional and effortful avoidance represented types of avoidance that made up Cluster C of the DSM-IV-TR's PTSD symptom criteria (APA, 2000). However, due to confirmatory factor analytic studies that support four-factor models of PTSD symptoms, there has been a split of effortful avoidance (Cluster C of DSM-V), and emotional numbing (Cluster D of DSM-V) into two separate symptom clusters (Friedman, Resick, Bryant & Brewin, 2011). Because most of the recent research has been conducted using DSM-IV diagnostic criteria, studies typically consider these types of avoidance together rather than separately. Yet, with the advent of this new separation of these types of avoidance, an understanding of emotional numbing and effortful avoidance as separate constructs is warranted (Asmundson, Stapleton & Taylor, 2004).

Reliance on measurement of avoidance between sessions has limitations. For research purposes, the measurement of avoidance symptoms in PTSD treatment typically relies on understanding trauma engagement by assessing avoidance via psychometric

instruments that include a list of PTSD symptoms, which include avoidance symptoms. For example, common methods of assessing PTSD symptoms include interviews (e.g., Clinician Administered PTSD Scale; CAPS; Blake, et al., 1990; PTSD Symptom Scale-Interview; PSS-I; Foa, Riggs, Dancu & Rothbaum, 1993) or self-report measures (e.g., PTSD Checklist PCL; Weathers, Litz, Herman, Huska & Keane, 1993; Posttraumatic Diagnostic Scale; PDS; Foa, 1995; PTSD Symptom Scale; PSS; Foa, et al., 1993; Impact of Events Scale; IES; Horowitz, Wilner & Alvarez, 1979; Trauma Symptom Inventory; TSI; Briere, 1995). Researchers often use these measures to monitor PTSD avoidance symptoms by tracking Cluster C symptoms over the course of treatment. For example, Nishith, Resick and Griffin (2002) monitored avoidance with the PSS, which was administered to clients every other session during a course of PTSD treatment. This study analyzed the pattern of avoidance cluster scores for clients in CPT and PE using curvilinear estimation techniques. Interestingly, they found differences between CPT and PE. CPT avoidance scores decreased linearly, but for PE, avoidance scores were quadratic and increased slightly before decreasing (Nishith, et al., 2002). Although reviewing avoidance cluster scores from symptom measures is informative, it is not without drawbacks. The use of self-report measures of PTSD symptoms are sometimes biased and difficult for clients to measure retrospectively. Moreover, the symptom measure in and of itself yields limited information because it does not specifically measure whether the patient is engaging with the trauma memory in-session. Rather, it reflects symptomatology outside of the therapy room that occurs between-sessions.

Efforts have also ensued to measure emotional numbing among clients with PTSD. Similar to the PTSD symptom scales, research is able to incorporate measures of

emotional reactions to identify client emotional numbing after experiencing a trauma. The Emotional Numbing and Reactivity Scale (ENRS; Orsillo, Theodore-Oklota, Luterek & Plumb, 2007) has been used to identify a range of emotional reactions to various events. Additionally, some researchers have utilized the CAPS to measure emotional numbing by isolating symptoms (i.e., inability to recall aspects of the event, diminished interest, detachment, restricted affect, sense of foreshortened future) to create a numbing scale (e.g., Taylor, et al., 2003). Similarly, researchers have also set apart the numbing items from the PSS-I to measure emotional numbing (Feeny, Zoellner, Fitzgibbons & Foa, 2000).

Measures of psychosocial functioning represent an attempt to monitor avoidance by assessing a client's effortful avoidance. For example, these self-report measures (e.g., Social Adjustment Scale Self Report; SASSR; Weissman, Prusoff, Thompson, Harding & Myers, 1978; Multidimensional Scale of Perceived Social Support; MSPSS; Zimet, Dahlem, Zimet & Farley, 1988; Quality of Life Inventory; QOLI; Frisch, 1999) provide information for clinicians about aspects of clients' lives that they are attempting to avoid. When these measures are utilized in research, they are typically reported as change scores from pre-treatment to post-treatment (e.g., MSPSS- Fischer, Sherman, Han & Owen, 2013; QOLI- Galovski, Blain, Mott, Elwood & Houle, 2012). Despite the fact that this is useful information about client change in effortful avoidance throughout the course of PTSD treatment, these measures do not assess the ways in which the client attempts to avoid the memory within-session (e.g., changing the topic away from trauma), and therefore is limited in its utility.

In summary, with the use of PTSD symptom scales, emotional numbing measures, and psychosocial functioning measures, researchers have tried to gain an understanding of client emotional and effortful avoidance. Yet, these measures assess retrospective accounts of symptoms that occurred at a time in the past (e.g., past week) while outside of the therapy session. Because crucial treatment gains can be made within the session, efforts should be made to monitor client avoidance in-session.

Importance of in-session engagement. Although some aspects of avoidance are measured with the use of between-session assessment, a more complete understanding of client avoidance is warranted. In-session monitoring of client avoidance is imperative for several reasons. Theoretically, information processing theory and cognitive theory emphasize the importance of clients addressing their memories of the traumatic events. Information processing theory requires this so that clients can create a new network in which the stimulus does not elicit fear responses or interpretations of danger (Foa & Kozak, 1986; Foa & McNally, 1996). Cognitive theory also contends that clients need to think about the traumatic events so that they are able to identify and alter their maladaptive beliefs (Resick, et al., 2008; Resick & Schnicke, 1992). In both of these theories, it is hypothesized that PTSD develops and is maintained by cognitive and emotional avoidance of the traumatic memory. Thus, it follows that in-session avoidance must be diminished to achieve therapeutic gains.

The ability for clients to engage with the memory within the therapy session is also clinically important. The PE protocol also stresses that clients need to engage with the trauma memory within-session. The goal of PE is to decrease avoidance in-session by having the client repeatedly engage in imaginal exposures that typically last between 45

and 60 minutes of the session (Foa, et al., 2007; Foa & Rothbaum, 1998; Foa, et al., 1991). During the exposures, clients are able to alter the meaning they ascribe to the feared stimulus and habituate the fear emotions associated with the memory (Foa & Kozak, 1986).

The CPT protocol maintains the goal of decreasing avoidance in-session by teaching clients to safely engage with the trauma memory and identify their trauma-related thoughts (Resick, et al., 2008; Resick & Schnicke, 1992). Throughout treatment, they are taught to reconstruct the maladaptive and inaccurate beliefs that are preventing them from recovering, with a constant emphasis on the need to remain trauma-focused and not become distracted with current psychosocial stressors. Likewise, the protocol encourages clients to experience their natural affect in-session (Resick, et al., 2008; Resick & Schnicke, 1992). Both of these protocols aim to have clients engage with the trauma memory throughout every session so that PTSD is no longer maintained. Thus, it is apparent that in-session avoidance is a key piece of therapy, from a theoretical as well as clinical standpoint.

Empirical support for in-session trauma engagement. Currently, there is a dearth of information about the extent to which in-session client avoidance impacts recovery from PTSD. Because emotional numbing and effortful avoidance are now conceptualized as two distinct clusters, they will be reviewed separately. The bulk of the empirical literature surrounding in-session client avoidance has focused on emotional numbing. For over a century, theorists have supported the emotional engagement hypothesis, or the idea that one must emotionally connect with the trauma memory for recovery to occur (Jaycox, Foa & Morrall, 1998). One way in which researchers have aimed to investigate

emotional engagement is through physiological measurement. Studies have incorporated the use of psychophysiological measurement of bodily reactions to understand avoidance in the realm of PTSD (Friedman, Keane, & Resick, 2007). Psychophysiological measurement serves to simulate in-session measurement of emotional avoidance by measuring physical reactions while a client is presented with a trauma-related task. It is useful because it provides a more objective measurement of emotional engagement than self-report questionnaires. However, the physiological indices assess emotional engagement in a lab setting in which trauma material is presented or discussed. Although this serves as a proxy for in-session engagement, physiological measurement is not utilized within therapy sessions and thus does not provide a true measure of in-session emotional engagement.

Investigators employing psychophysiological measurement have utilized various tasks for understanding how participants engage emotionally with trauma-related information. Some have measured physiological indices (e.g., heart rate) while participants engage in a trauma monologue activity (e.g., Griffin, Resick, & Mechanic, 1997; Pineles, Street, Resick, Griffin, Moustoufi, & Ready, 2011). This activity consisted of five phases, with physiological reactivity measured throughout. These five phases included a baseline phase, neutral topic monologue, recovery phase, traumatic event monologue, and final recovery phase. The more one is emotionally engaged, the more reactivity is expected. Specifically, the participants with higher dissociation (Griffin et al., 1997) and more avoidant coping strategies (Pineles et al., 2011) show less reactivity due to less emotional engagement during this trauma monologue activity.

Other studies have measured emotional numbing in response to trauma and non-trauma related (i.e., pleasant and aversive) images. Litz, Orsillo, Kaloupek and Weathers (2000) have assessed heart rate and skin conductance level to contribute to the conceptual understanding of emotional numbing in PTSD. This study had trauma-exposed veterans with and without PTSD view positive and negative images before and after being primed with a trauma-related stimulus. Participants who had PTSD had similar physiological reactivity to those without PTSD to both negative and positive stimuli prior to being primed with the trauma-related stimulus. However, after this prime, they had more reactivity to negative stimuli and more suppressed emotional reactivity to positive stimuli than those without a PTSD diagnosis (Litz et al., 2000). Another study replicated this procedure, but used startle response to measure reactivity to positive and negative stimuli, both before and after exposure to a trauma-related stimulus (Miller & Litz, 2004). This study had similar findings as Litz and colleagues (2000). The implications of these findings are that those with PTSD do not tend to have a generalized emotional numbing response to all stimuli. Instead, they have heightened reactivity to negative stimuli and suppressed reactivity to positive stimuli after they experience a stressor (i.e., trauma stimulus).

Another way that physiological measures have been used to monitor emotional reactions to trauma-related stimuli is by measuring dissociation. Dissociation occurs when clients have an emotional detachment from the trauma memory and is characterized by alterations in memory, identity, or consciousness (Van der Hart & Horst, 1989; Lynn & Rhue, 1994). Emotional numbing has often been conceptualized as a component of dissociation (Spiegel, 1997), and has been included in dissociation measures in a number

of studies examining the relationship between peritraumatic dissociation and development of PTSD (Feeny, Zoellner, Fitzgibbons, & Foa, 2000). Psychophysiological measurement has been used to examine the relationship between dissociation and physiological symptoms, as a proxy measurement for numbing. Mixed results have emerged with some studies finding that dissociation is related to blunted physiological reactivity (e.g., Griffin et al., 1997), and other studies concluding that dissociation is related to accentuated physiological reactivity (e.g., Hetzel-Riggin, 2010). However, results from these studies must be interpreted with caution. Although these studies measure dissociative experiences, dissociation is typically defined much more broadly than emotional numbing (i.e., can include re-experiencing and avoidance symptoms; as cited in Friedman, Keane, & Resick, 2007), and recent empirical investigation has found that dissociation is a separate construct from emotional numbing (Feeny et al., 2000). Thus, both dissociation and emotional numbing serve as ways in which clients could disengage with the memory of the traumatic event during the therapy session. However, emotional numbing is a more feasible construct to measure within-session because it is likely perceived more easily by a therapist.

In addition to measuring avoidance by monitoring physiological reactivity, studies have measured emotional numbing within the session with the use of self-reported subjective units of distress (SUDS; Wolpe, 1990). SUDS ratings serve as an indicator of how much anxiety or distress a client is experiencing at a particular moment, and are tailored for each client on a scale of 0-100, based on their own personal experiences. SUDS are used within PE's treatment protocol, and are measured continuously (every 5-10 minutes during the 45-60 minute imaginal exposures) to assess the intensity of the

client's fear (Foa, Hembree & Rothbaum, 2007; Foa & Rothbaum, 1998; Foa, Rothbaum,

Riggs & Murdock, 1991). Because the goal of PE is to activate the fear network, SUDS

ratings indicate whether clients are emotionally engaged with the memory, or whether

they are numbing themselves during the imaginal exposure. Furthermore, because

habituation is expected in PE treatment, SUDS ratings provide measures of whether

clients habituate, or experience a decrease in their distress within-session (i.e., decrease in

SUDS ratings during the imaginal exposures), or between session (i.e., decrease in SUDS

ratings across imaginal exposures over the course of treatment). Thus, SUDS ratings

provide a useful in-session measurement of whether a client is emotionally engaged with

the memory of the traumatic event, or whether he is numbing. A number of studies have

utilized this method to measure in-session emotional engagement.

One study that utilized SUDS ratings to assess emotional engagement throughout

the course of treatment found that clients with high emotional engagement and gradual

habituation experienced improved symptoms by the end of treatment (Jaycox, Foa &

Morrall, 1998). This study utilized clients' SUDS ratings to indicate their level of

emotional engagement during the PE imaginal exposures. Authors calculated clients'

average within-session habituation scores (i.e., final SUDS score minus highest SUDS

score within a session; Kozak, Foa & Steketee, 1988) and between session habituation

scores (i.e., SUDS changes from session to session). These served as indicators that the

participants experienced decreased fear intensity throughout the course of the sessions'

imaginal exposures. The authors conducted a hierarchical clustering analysis that found

three patterns of clients. These included clients with high emotional engagement who

experienced gradual habituation, those who were highly emotionally engaged but did not

habituate, and a final group that had low emotional engagement and did not habituate (Jaycox, et al., 1998). This study demonstrated that those who were able to emotionally engage and experience habituation had the best post-treatment outcomes, such that higher engagement and habituation led to decreased posttraumatic symptoms. Thus, this article serves as an example of using in-session measurement of emotional engagement and avoidance to evaluate treatment outcome.

Other studies have also utilized SUDS ratings to monitor emotional numbing in-session. van Minnen and Hagenaars (2002) researched emotional engagement within and between the first two sessions of PE in order to see how this relates to treatment response. In this study, participants partook in nine weekly 60-minute imaginal exposure sessions, and reported their SUDS ratings every 10 minutes. The results of this study were that those who responded well to treatment (had decreased posttraumatic stress, depression, and state-anxiety scores) experienced more between-session habituation between session 1 and session 2 than those who were non-responders (van Minnen & Hagenaars, 2002). This article also supports the notion that emotional engagement with the trauma material is essential in each session in order for symptom improvement to ensue.

Another study investigated emotional engagement by exploring the role that duration of imaginal exposure has on treatment outcome. This study assessed in-session emotional engagement by comparing 30 minute imaginal exposures to 60 minute imaginal exposures within a PE protocol (van Minnen & Foa, 2006). Based on information processing theory, it was hypothesized that the longer duration of imaginal exposure would lead to more emotional habituation, and thus result in better treatment outcomes for those who had 60 minutes of exposure compared to those with 30 minutes.

This study found that the 60 minute imaginal exposure led to greater within-session habituation, but did not lead to improved treatment outcome. Moreover, the groups did not differ in their between-session habituation scores, but this type of habituation was related to treatment outcome, such that those with more between-session habituation experienced more recovery in their PTSD symptoms (van Minnen & Foa, 2006). Interestingly, this finding suggests that the amount of emotion one experiences within session may not be what contributes to improved outcome, but instead it is the repeated emotional engagement with the trauma memory that is important.

   The use of SUDS ratings as an indicator of emotional engagement is useful because it provides a continual measure of emotional avoidance within each session. Clinically, it is helpful because it aids clinicians in identifying which aspects of the traumatic event may be most distressing to clinicians (e.g., "hot spots"). Despite the utility of SUDS ratings, they also present limitations. The empirical research on SUDS ratings are typically in the PE literature, and tend to focus on "distress" ratings that are usually measuring fear. Because of this, there is limited knowledge of emotional numbing in other PTSD treatments, and there is a lack of assessment of other emotions that could be relevant (e.g., guilt, anger, sadness) to understanding emotional avoidance.

   While efforts have been made to measure in-session emotional avoidance, effortful avoidance has received less empirical investigation. Within PE and CPT protocols, clients are urged not only to "feel their feelings," but also to disengage the intentional avoidance of people, places and activities that remind them of the event (Foa, et al., 2007; Foa & Rothbaum, 1998; Foa, et al., 1991; Resick, et al., 2008; Resick & Schnicke, 1992). As previously mentioned, effortful avoidance is typically quantified

with self-report measures of PTSD symptoms or psychosocial functioning questionnaires between sessions. Although this provides useful information about what clients are doing while out of session, it ignores ways in which clients can effortfully avoid the trauma memory within the therapy session. Clinically speaking, one of the most obvious ways that a client may engage in effortful avoidance is by changing the topic of conversation away from discussion of the traumatic event. Perhaps clients may also intellectualize or become angry in an attempt to stop talking about the trauma. Because of this, PTSD treatment protocols have built-in strategies to reduce effortful avoidance.

Effortful avoidance can occur in PE when the client omits details or important aspects of the traumatic event during the imaginal exposure. When this occurs, the clinician is expected to ask questions that provoke the client to discuss the event in more detail. Also, the clinician may ask the client to repeat the portions of the traumatic event that they appear to be avoiding (Foa, et al., 2007; Foa & Rothbaum, 1998; Foa, et al., 1991).

CPT attempts to decrease effortful avoidance by challenging client stuck points related to avoidance (Resick, et al., 2008; Resick & Schnicke, 1992). For example, if a client believes that talking about the event will be harmful, the clinician identifies this as a stuck point and collaboratively challenges this belief so that the client comes to a different understanding about the role that avoidance is serving in maintaining PTSD. Despite the potential implications that in-session effortful avoidance has on maintaining PTSD symptoms, it has not received sufficient empirical investigation.

In summary, trauma-engagement has historically been measured with between-session scores via self-report measures. These self-report measures do not assess in-

session avoidance or the client's ability to remain trauma-focused, a critical ingredient in trauma therapy. The lack of attention to in-session avoidance across these trauma therapies is problematic because the therapy session is the front line for skill acquisition that the patient will need to utilize in their own lives, where it is most needed. Although some strategies attempt to measure emotional avoidance in-session (e.g., SUDS ratings), these are based on measurement of fear, rather than other emotions that also may be relevant (guilt, anger) and do not necessarily measure the extent to which a client is able to stay on topic in session. Consequently, it is clear that the role of in-session avoidance on treatment outcome needs to be investigated in future research.

Homework compliance. In addition to in-session trauma engagement, PTSD treatments also underscore the importance of clients completing practice work while out of session so that they have additional opportunities to engage with the trauma memory. Although clearly a significant component of therapy, the topic of homework compliance was rarely mentioned in the empirical literature until the 1990s (Fehm & Mrose, 2008).

Empirical support for homework in PTSD treatment. Incorporating homework into treatment is a core tenet of CBT. It is employed so that clients can practice the skills learned in therapy (Sokol, Fox & Becker-Weidman, 2014) and apply them to daily life (Fehm & Mrose, 2008). Research focusing on homework has addressed a number of topics. For example, some research provides information about therapist and client perspectives of homework (e.g., Fehm & Mrose, 2008), while other research reports the number of hours clients spend working on homework within a specific protocol (e.g., Lee, Gavriel, Drummond, Richards & Greenwald, 2002). Still other articles provide ideas for therapists to improve homework compliance (e.g., Huppert, Ledley, & Foa, 2006;

Tompkins, 2002). Another essential area of the homework literature considers the client's role in completing practice work.

Homework compliance refers to client adherence with homework assignments. Therapists can assign practice activities, but clients ultimately control whether they are completed. Clinically, it seems that the use of homework in treatment should be related to treatment outcome, yet empirical support for this idea was lacking until recently (Kazantzis, 2000), and much of the existing research was under-powered to determine a significant effect (Kazantzis, Deane, & Ronan, 2000). Researchers have utilized meta-analytic techniques to assess the relationship between homework compliance and treatment outcome among cognitive behavioral therapies for a variety of mental disorders (Kazantzis, et al., 2000). The conclusion of this meta-analysis was that the use of homework in treatment had a moderate effect on treatment outcome and that overall homework compliance (client attempt to complete the homework) had a small effect on treatment outcome (Kazantzis, et al., 2000). Much of the research on this topic explores the relationship between compliance and outcome in the realm of other anxiety disorders (e.g., specific phobias, panic disorder, agoraphobia, social phobia, and obsessive compulsive disorder), with less attention given to how it affects PTSD treatment outcomes (Huppert, et al., 2006). Hence, an exploration of homework compliance in relation to PTSD treatment outcome is warranted.

From a theoretical standpoint, homework compliant clients should experience greater reductions in posttraumatic symptoms than non-compliant clients. Information processing theory relates to homework compliance by asserting that activation of the fear network allows for the introduction of incompatible information (Foa & Kozak, 1986)

and habituation of fear (Foa & Rothbaum, 1998). Empirical investigations have found that between-session habituation relates to treatment outcome, but within-session habituation does not (Jaycox & Foa, 1998; van Minnen & Foa, 2006). Taken together, the theoretical assertions and empirical evidence indicate that it is the repeated nature of engaging with the trauma memory that is essential to decreasing posttraumatic symptomatology in PE. Thus, clients with PTSD who repeatedly think about the traumatic event through engagement with homework assignments are likely to benefit from their efforts to activate the memory. Cognitive theory also supports the notion that homework compliance should relate to improved treatment outcome. According to this theory, people with PTSD have maladaptive assimilated and over-accommodated beliefs about the event, themselves, others, and the world that need to be challenged to become accommodated (Resick, et al.,, 2008; Resick & Schnicke, 1992). The use of homework between sessions allows for clients to identify their erroneous trauma-related cognitions, challenge them, and create more balanced beliefs that lead to less intense negative emotions.

Both PE and CPT include homework assignments that are designed for clients to have the opportunity to engage with trauma-related thoughts and emotions between each session. In PE, clients are expected to listen to the imaginal exposure portion of session tapes daily to allow for continued opportunities for habituation (Foa, et al., 2007; Foa & Rothbaum, 1998; Foa, et al., 1991). Furthermore, clients in this treatment are also assigned out-of-session in vivo exposures so that they can practice confronting cues reminiscent of their trauma in a safe way to decrease avoidance and increase functioning (Foa, et al., 2007; Foa & Rothbaum, 1998; Foa, et al., 1991).

CPT shares the assumption that between-session practice-work is essential for recovery from PTSD. Specifically, the CPT protocol utilizes worksheets to help clients identify the relationship between stuck points and emotions (with ABC worksheets) and alter them (with challenging questions worksheets) (Resick, et al., 2008; Resick & Schnicke, 1992). The practice-work also creates an opportunity for clients to experience natural emotions and reduce manufactured emotions as they engage with the trauma memory outside of session (Resick, et al., 2008; Resick & Schnicke, 1992). Because these treatments value the use of homework, therapists implementing these protocols are expected to address homework noncompliance throughout treatment and problem-solve to decrease difficulty.

Empirical findings specifically for homework compliance. Currently, there is little empirical exploration of homework compliance in the PTSD literature (Huppert, et al., 2006). One way that homework compliance has been quantified is through a frequency measurement of the number of times that clients work on a homework assignment. van Minnen and Hagenaars (2002) researched the relationship between homework compliance and symptom improvement among PTSD-positive clients participating in PE. They measured compliance by the number of times that clients listened to their audiotaped in-session imaginal exposures between sessions. This study found no difference between participants who improved and those who did not improve in therapy based on their level of homework compliance, and they actually found that those who did not improve were slightly more compliant (i.e., 53.8% of non-improvers were compliant, whereas 47.3% of improvers were compliant). Conclusions about the importance of homework compliance, however, are limited because the purpose of this

study was to look at early process predictors of outcome, and thus only focused on the compliance between the first two exposure sessions. Therefore, there was only one measure of compliance throughout treatment, and this was the first time the clients were expected to complete the assignment of listening to their audiotaped imaginal exposure. It is possible that participants may have been compliant in later sessions, but this was not investigated. Therefore, further research could improve the field's knowledge by investigating the role of homework compliance when it is measured throughout an entire course of PTSD treatment.

Other research has found a relationship between homework compliance and posttraumatic symptom reductions by measuring compliance as the percentage of homework completed. Specifically, one RCT that compared CBT versus treatment as usual (i.e., supportive counseling) and measured whether clients had incomplete, partially complete, or complete homework assignments in each session (Mueser et al., 2008). Researchers reported that the clients' overall homework compliance throughout treatment was related to decreases in posttraumatic symptomatology as well as fewer negative trauma-related beliefs at post-treatment (Mueser et al., 2008). The conclusion that homework compliance is related to treatment outcome in this study enhanced the literature on this topic by looking at homework compliance in a new manner. Instead of only assessing homework compliance at the beginning of treatment, as van Minnen and Hagenaars (2002) did, this study tracked homework compliance by measuring completion throughout the entire course of treatment.

Other empirical findings related to homework compliance. Additionally, client variables that impact homework compliance have also been analyzed. A study assessing

homework compliance within a PE protocol assessed pre-treatment variables related to compliance. This study assessed the relationship between pre-treatment PTSD severity and participants' compliance with PE's imaginal exposure homework assignments (Scott & Stradling, 1997). Researchers found that participants who were compliant with the homework had less severe pre-treatment levels of PTSD and depression symptoms compared to those who were considered non-compliant. This study also measured compliance over a three-week time period in relation to outcome and found that homework compliance was related to posttraumatic symptom reductions. Similar to the previous research reviewed, this study also had limitations. For example, it defined homework compliance as listening to the imaginal exposure tape at least three times per week for three weeks (Scott & Stradling, 1997). Clearly, this differs from the way PE assigns the imaginal exposure homework because in the typical PE protocol, clients are expected to listen daily to the tape in between sessions (Foa, et al., 2007; Foa & Rothbaum, 1998; Foa, et al., 1991). However, this study provides insight for the importance of reviewing homework compliance throughout an entire treatment protocol since PTSD severity can impact compliance. Perhaps as clients begin to experience reduced posttraumatic symptoms, they will be more compliant with assignments.

Despite the fact that homework compliance has been assessed among PTSD treatments, it remains unclear the extent to which homework compliance influences outcome. Given the varying ways in which homework compliance was defined and measured, equivocal results, and differing conclusions of these studies, the importance of homework compliance to PTSD treatment outcomes is currently inconclusive. Additionally, many of the studies that assess this issue are from the PE literature and

focus on adherence to imaginal exposure assignments. Nonetheless, other types of trauma therapy also have homework assignments (e.g., CPT), and compliance or non-compliance may effect treatment outcome for those treatments differently than for PE. Overall, further research in this area is needed to understand the role of client homework compliance in clinical practice.

      Consistent treatment attendance. So far, both client avoidance within session (i.e., in-session trauma engagement) and between sessions (i.e., homework compliance) have been reviewed as client process variables that could impact treatment outcome. Poor therapy attendance, by definition, is another strategy that clients could use to avoid engagement with the traumatic event. Attendance is a central element of treatment and has been shown to correlate with treatment outcome, such that the more sessions a client receives, the more symptom improvement the client will experience (Howard, Kopta, Krause & Orlinsky, 1986). However, this dose-response model differs by type of pathology, and authors have concluded that anxiety disorders typically have the best treatment outcomes when clients receive between 8 and 13 sessions (Howard, et al., 1986). Other researchers have expanded upon this investigation of the appropriate "dose" of therapy for clients by assessing treatment length (i.e., total number of therapy sessions) in relation to treatment outcome. In PTSD literature, RCTs have explored the relationship between number of sessions and treatment outcome by offering a flexible number of therapy sessions (9-12 sessions in PE; Foa et al., 2005; 4-18 sessions in CPT; Galovski, Blain, Mott, Elwood & Houle, 2012). They have found that treatment outcomes can be enhanced by offering a flexible number of sessions based on individual client needs.

In addition to treatment length, much of the literature surrounding attendance focuses on the ultimate form of non-attendance, or drop-out. A number of predictors of drop-out have been investigated, such as improved symptoms prior to termination, temporary increases in symptoms after treatment begins, logistical barriers, and refusal to engage in the type of treatment offered, to name a few (Schottenbauer, Glass, Arnkoff, Tendick & Hafter Gray, 2008). Additionally, treatment tolerability has been investigated as a predictor of treatment drop-out. Researchers have compared drop-out rates for PTSD treatments that include exposure, cognitive restructuring, EMDR, and stress inoculation training and found that they do not differ significantly (Hembree, Foa, Dorfan, Street, Kowalski, & Tu, 2003). Although there is some research on factors associated with therapy drop-out, a dearth of knowledge exists for how regularity of attendance (in the absence of total drop-out) impacts outcome.

Importance of consistent attendance. Consistent, or regular therapy attendance, seems to relate to treatment outcome for several reasons. Clinicians typically present skills to clients in a sequence so that techniques can build upon each other (Otis, Keane, Kerns, Monson & Scioli, 2009). When consistent attendance is interrupted due to missed sessions, this can interfere with "therapeutic momentum" (Otis, et al., 2009, p. 1307). Because clients with PTSD struggle with avoidance, they may be tempted to avoid coming to therapy sessions so that they do not have to engage with the trauma memory.

According to the theories behind PE and CPT, consistent attendance seems imperative for beneficial treatment gains. Information processing theory supports the idea that clients should have regular treatment attendance for several reasons. By attending sessions regularly, clients are increasing the opportunity to have their trauma fear

structure activated, which is a necessary component for habituation (Foa & Kozak, 1986). By definition, this reduces avoidance and allows for the introduction of incompatible information that aids in the creation of a new, adaptive memory structure (Foa & Kozak, 1986; Foa & McNally, 1996). Cognitive theory also supports the importance of regular treatment attendance because consistent attendance provides more opportunities to analyze the content of trauma-related cognitions (Resick, et al., 2008; Resick & Schnicke, 1992). This allows for integration of the trauma material with existing belief systems to create more accommodated beliefs. Altering one's maladaptive assimilated and over-accommodated thoughts can also intervene to reduce the intensity of manufactured emotions. Finally, the passage of time between sessions could hinder one's ability to learn information presented in therapy and retain skills that are honed within sessions.

In addition to theoretical support, clinically, consistent treatment attendance seems crucial. The CPT manual explicitly states that the "patient will be expected to attend all sessions regularly (once per month is not sufficient)" (Resick & Schnicke, 1992, p.5) and therapists are expected to explain the importance of regular attendance during the first session of this protocol.

Researchers conducting treatment outcome studies also have emphasized the importance of consistent attendance by investigating various aspects of this topic. Specifically, some treatment outcome studies mention attendance rates in their samples (e.g., Foa, et al., 1991; Resick, Uhlmansiek, Clum & Galovski, 2008), whereas others take a more proactive stance and suggest strategies for improving attendance rates. For example, researchers using a combined CPT and CBT for pain protocol conducted as part of a pilot study found that rates of attendance were high throughout early sessions of

treatment but tapered for later sessions (Otis, et al., 2009). The authors suggested reminder phone calls and attempts to schedule sessions on days that clients had other scheduled appointments as strategies that could help with treatment attendance (Otis, et al, 2009). Another manuscript described the implementation of CPT to Kurdistan women and addressed barriers to attending treatment (Kaysen, Lindgren, Zangana, Murray, Bass & Bolton, 2013). With the use of negotiation, therapists spoke with clients early in treatment and agreed upon the specific number of sessions that each client would definitely agree to attend (typically less than 12 sessions). Clinicians then encouraged additional sessions after the agreed-upon goal was met (Kaysen et al., 2013).

   Empirical support for the importance of treatment consistency. Overall, based on theoretical support and clinical suggestion, it appears that there is implicit support for the idea that regular attendance is crucial. However, relatively few studies have specifically addressed treatment consistency and its impact on outcome, especially within the PTSD literature. To date, two studies exist that specifically analyze the role of treatment consistency in relation to treatment outcome.

   Within the extant literature, one study analyzed number of therapy sessions and duration of treatment within a university clinic sample (Reardon, Cuckrowicz, Reeves & Joiner, 2002). When these variables were regressed on treatment outcome, neither one had a significant main effect. However, when assessing the interaction of these variables, the authors found that they interacted, such that, for clients who attended fewer than 11 sessions, the longer the duration of treatment, the worse the outcome. These findings suggest that for clients attending fewer sessions, treatment consistency is related to outcome. The authors took the analyses a step further by also assessing the density of

treatment, or average number of sessions per week throughout the course of treatment. The findings revealed that more dense, or consistent, treatment was related to improved outcomes for clients remaining in therapy for shorter periods of time. Thus, these findings support the notion that clients who receive fewer therapy sessions need to attend regularly (Reardon, et al., 2002). Because this study focused on clients with a variety of clinical presentations, it is important to see if these findings hold when looking specifically at clients with PTSD.

One study exists that addressed the relationship between consistent therapy attendance and PTSD treatment outcome. This study included clients receiving cognitive therapy (a combination of CBT and CPT) or exposure therapy (based on PE techniques) for PTSD and assessed how various aspects of attendance related to treatment outcome (Tarrier, Sommerfield, Pilgrim & Faragher, 2000). Analyses showed that the number of missed sessions, duration of therapy, number of sessions attended, and frequency of sessions attended (i.e., mean number of days between sessions) predicted change in PTSD symptomatology (Tarrier, et al., 2000). When entered into a stepwise regression, duration of therapy was the biggest predictor of outcome, such that the shorter duration of therapy was related to better outcome. The authors suggested that a longer duration of therapy, due to missed sessions, led to worse outcomes than if the client had attended sessions in a more consistent manner over a shorter period of time. However, frequency of session attendance, which was measured as the number of days between sessions, did not predict outcome. Thus, consistent treatment attendance appears to be an important but complex variable because its relationship to outcome differs based on how it is measured.

Overall, research focusing on attendance has typically addressed ways in which clinicians can improve attendance rates, such as through addressing barriers to care (Trusz, Wagner, Russo, Love & Zatzick, 2011). Currently, there is a scarcity of research that investigates the regularity of treatment attendance, which could be a critical component of treatment for those suffering from PTSD. Based on theoretical and clinical support, consistency does appear to be related to outcome for clients suffering from PTSD. However, this topic has not been adequately assessed empirically and needs further support to strengthen conclusions that can be drawn.

Non-Avoidance Individual Variables

It is imperative to mention that, although in-session trauma engagement, homework compliance, and consistent attendance can be indicators of avoidance, exceptions clearly exist. Individual differences due to cultural, demographic, situational, and societal factors may apply. For example, cultural norms and values (Butler, Lee & Gross, 2007), as well as sex differences (Gross & John, 2003) can influence the suppression of emotions. This has implications for PTSD treatments because clinicians may perceive clients as avoiding emotion. Yet, they may, in fact, be demonstrating rule-governed expression of emotion that stems from their background, which may be different from the therapist's. Thus, clients may express emotions in unique ways. For example, a study examining the efficacy of CPT for Bosnian refugees found that clients tended to hold their throat and experience a choking sensation when engaging with the trauma memory (Schulz, Huber, & Resick, 2006). The authors of this study explain that this behavior could be interpreted as sadness ("I'm all choked up") by clinicians, but is really a demonstration of panic. Therefore, it is essential that therapists take into account

the varying ways people can express emotions, rather than making the assumption that they are actively avoiding emotion.

Similarly, homework compliance can be impacted by these unique factors. For example, low education rates, lack of resources such as papers and pens, illiteracy, language barriers, and homelessness are all factors that could reduce a client's ability to complete homework. Fortunately, current treatments have made efforts to overcome some of these obstacles by translating homework materials into other languages (e.g., CPT into Spanish), and adapting protocols to fit cultural needs (e.g., Bass, et al., 2013; Kaysen, et al., 2013; Schulz, Huber, & Resick, 2006; Schulz, Resick, Huber & Griffin, 2006), to name a few. For example, CPT has been adapted to fit the cultural needs of Congolese (Bass, et al., 2013) and Kurdish trauma survivors (Kaysen, et al., 2013). Various alterations were made to the protocol to enhance the likelihood of success for these clients. Specifically, the Congolese clients and illiterate Kurdish clients completed the homework assignments orally. Also, to simplify the skills taught, clients were provided with worksheets that had pictures that served as cues to do the activities mentally (e.g., pictures of someone thinking to elicit the automatic thought, pictures of facial expressions to help clients identify emotions). Moreover, Kurdish clients did not have a word in their language that was equivalent to the "Esteem" and "Intimacy" modules in the typical CPT protocol, so these were translated to "Respect" and "Caring" modules. These studies illustrate the need for clinicians to understand cultural factors that should be addressed to enhance treatment. They also provide good examples of the importance of clinicians not assuming that clients are avoiding engagement with the

homework assignments when their compliance might be due to issues unrelated to avoidance.

Finally, situational variables can impact regularity of attendance. Clients who live in rural areas far from treatment centers face challenges with obtaining regular treatment. Additionally, clients with situational stressors and as logistical barriers, such as childcare problems, transportation difficulties, and financial stressors are likely to have more irregular attendance than other clients due to these difficulties, rather than because of avoidance. Fortunately, alterations in treatment modality (e.g., telemental health that implements videoconferencing) have been created and have demonstrated success for clients with PTSD (e.g., Germain, Marchand, Bouchard, Drouin, & Guay, 2009; Morland, Pierce & Wong, 2004). In these instances, it is clear that with help from a therapist in addressing these barriers, treatment attendance may be more regular.

Current Study

The aim of the present study was to assess how the process by which clients participated and engaged in treatment affected PTSD treatment outcomes. The three client process variables of interest included: client in-session engagement, homework compliance, and consistency of treatment attendance. Based on the prior research described previously, the current study hypothesized that client avoidance of engagement (i.e., avoidance of engagement with therapist, avoidance of engagement with the trauma memory, numbing) would be negatively associated with PTSD and depression change scores throughout the course of CPT. This study also expected to find that out-of-session avoidance, as reflected in homework noncompliance, would be negatively associated with PTSD and depression change scores. Finally, avoidance in the form of inconsistent

treatment attendance was anticipated to negatively impact improvements in PTSD and depression.

Parent Studies

Participant data (e.g., pre-treatment and post-treatment measures and video tapes of therapy sessions) from two previously-completed NIH-funded grants were used in this study. The first grant assessed the impact of offering a variable number of Cognitive Processing Therapy (CPT) sessions on PTSD treatment outcome (Galovski, 1R34-MH-074937). This grant provided a variable number of sessions with treatment's end being dictated by individual participant progress, such that participants received between 4 and 18 trauma-focused CPT sessions. This variable treatment length grant also allowed each client to obtain up to two "emergency sessions" in the event that crises arose (e.g., home foreclosure, death of a loved one, diagnosis of life-threatening illness) throughout the course of therapy. Therapy was provided by master's level clinicians who were trained in CPT and supervised by a licensed clinical psychologist who is a National CPT Trainer. Participants were assessed throughout this grant at pre-treatment, post-waitlist (for those in the waitlist symptom monitoring condition), post-treatment (2-weeks after completion of treatment), and at a 3-month follow-up. As clients progressed through treatment, clinicians monitored their Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995) and Beck Depression Inventory- 2nd edition (BDI-II; Beck, Steer, & Brown, 1996) scores to assess their progress. Several criteria determined when clients were ready to complete treatment. First, self-report scores were used to assess symptom severity. When clients demonstrated PDS scores ≤ 20 and BDI scores ≤ 18, therapists introduced the idea of termination. In addition to symptom scores, client as well as therapist opinion were taken

into account in determining the appropriateness of ending therapy. Approximately 58% of treatment completers utilized less than 12 sessions of CPT, and 42% received between 12 and 18 sessions (Galovski, Blain, Mott, Elwood & Houle, 2012). This variable length treatment design was shown to be effective, as participants showed significant improvements in a number of domains (i.e., PTSD, depression, guilt, quality of life, general mental health, social functioning, and health perceptions; Galovski, Blain, Mott, Elwood & Houle, 2012).

The second treatment trial was a Sleep-directed Hypnosis as a Complement to CPT study (Galovski, 1R21AT004079-01). This research study randomized participants to either a sleep-directed hypnosis condition plus CPT or a waitlist condition prior to CPT. Participants in the hypnosis condition received three sessions of sleep-directed hypnosis, whereas those in the waitlist condition monitored their symptoms during the three-week period. Next, all participants were provided 12 sessions of CPT by master's level clinicians trained and supervised by a National CPT Trainer. Unlike the Variable CPT trial, this study did not include the two "emergency sessions" and only included women. Data from this study were collected at pre-treatment, status check (completed at the conclusion of the initial 3-weeks sleep intervention phase), post-treatment, and 3-month follow-up. The data from this study indicated that both PTSD and depressive symptoms were significantly reduced from pre-treatment to post-treatment for both the hypnosis-CPT and CPT-only conditions (Galovski & Blain, 2013).

Specific Aims and Hypotheses

Aim 1. This study aimed to understand the extent to which in-session avoidance of engagement contributed to treatment outcome.

Hypothesis 1. Client avoidance of in-session engagement, as measured by two indicators (e.g., avoidance of engagement with therapist, avoidance of engagement with trauma memory) will be negatively associated with changes in posttraumatic symptoms and depression scores from pre-treatment to post-treatment.

Hypothesis 2. Visible display of affect (e.g., sadness, anger, fear) will be positively correlated with change in posttraumatic symptoms and depression scores from pre-treatment to post-treatment.

> *Sub-hypothesis 2a:* Client numbing while in-session will be negatively correlated with changes in posttraumatic symptoms and depression scores from pre-treatment to post-treatment.

Aim 2. The second purpose of the current study was to evaluate the extent to which homework compliance impacts treatment outcome.

> *Hypothesis 3.* Client subjective report of amount of homework completed, the percentage of worksheets returned (number of worksheets returned to session in relation to total number assigned), client report of how helpful the homework was, and client report of time spent on homework will be positively associated with changes in posttraumatic and depressive symptoms from pre-treatment to post-treatment.

Aim 3. The final aim of this study was to investigate the role that consistent treatment attendance played in treatment outcome.

> *Hypothesis 4.* Client consistency of session attendance (percentage of scheduled sessions attended) will be positively associated with change in posttraumatic and

depression symptoms. Irregularity of sessions (average number of days between each session) will be negatively associated with change in posttraumatic and depression symptoms from pre-treatment to post-treatment, such that the more irregular the sessions (more days between sessions), the less change in symptoms will occur.

Method

Participants

Participants in the current study included clients who participated in the two NIH-funded parent trials previously described. For this research study, several inclusion criteria were required. Clients had to be at least 18 years of age, at least three months post-trauma, and PTSD-positive at the pre-treatment assessment. Participants were disqualified from the trials if they were currently experiencing psychotic symptoms, a manic episode, substance addiction, mental retardation, had active suicidal ideation, or were living in a peritraumatic situation. Participants who were on medication also were required to maintain a stable dosage of medications.

Participants in the current study included men and women from the two parent trials (42% of Variable trial clients, 45% of Hypnosis trial clients). Because the current study included analyses of in-session client variables, participants were selected if they had complete CPT session tape sets (i.e., no missing session tapes and no tapes with damaged audio/video), or nearly complete tape sets (i.e., no more than 1 missing session tapes or 1 tape with damaged audio/video). Because the revised CPT adherence and competence form used to code the tapes includes items for the typical 12-session CPT protocol, no tapes for sessions 13 through 18 from the Variable Treatment Length trial

were included. Thus, participants in the Variable trial grant who completed more than 12 sessions only had their first 12 sessions coded. For the current study (Table 1), a total of 550 session tapes were available for coding. Among the treatment completers, 181 tapes were available for the Variable trial participants and 299 tapes were useable for the Hypnosis trial. For treatment drop-outs, 25 tapes were available for the Variable trial participants, and 45 were useable for the Hypnosis trial participants. In total, 70 participants (29 from the Variable trial, 41 from the Hypnosis trial) were selected as participants for the current study. Of the 70 participants, 47 were treatment completers and 23 were treatment drop-outs. Participant data was collected at pre-treatment, each session, post-treatment, and a 3-month follow-up. Participants were modestly compensated ($50) after each assessment.

Measures

Beck Depression Inventory-2nd Edition (BDI-II). The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item self-report measure used to assess depressive symptomatology in the past two weeks. This measure utilizes a Likert scale from 0 (*no endorsement of symptom*) to 3 (*severe endorsement of symptom*) to indicate the severity of depressive symptoms. To score this measure, one must sum the 21 items to create a total score. This measure displays strong psychometric properties, such as high internal consistency (α = .91) and internal reliability (Dozois, Dobson & Ahnberg, 1998). The current study utilizes the BDI-II at pre-treatment and post-treatment. It also measures between-session depressive symptoms by measuring BDI-II symptoms at each session throughout the course of CPT.

Clinician-Administered PTSD Scale -4th Edition (CAPS-IV). The CAPS-IV

(Blake et al., 1990) is considered the "gold-standard" measure for assessing post-

traumatic symptoms. This 25-item measure is a clinician-administered semi-structured

interview that assess re-experiencing, avoidance, and arousal symptoms, as well as

information about onset, duration, subjective distress, and impairment in functioning. The

CAPS assesses for the frequency of each symptom on a 0 (*never*) to 4 (*daily or almost*

every day) Likert scale, as well as the intensity of each symptom on a 0 (*never*) to 4

(*extreme, incapacitating distress*) scale. In order to qualify as having a symptom, the

symptom must receive at least one on the frequency rating and at least two on the

intensity rating. To meet criteria for PTSD, a client must endorse enough symptoms to

have at least one re-experiencing symptom, three avoidance symptoms, and two arousal

symptoms (DSM-IV-TR; APA, 2000). This measure demonstrates strong psychometric

properties, including high inter-rater reliability (r= .92-.99; Blake et al., 1990) and test-

retest reliability (r= .93 for frequency scores and .95 for intensity scores; Weathers,

Ruscio, & Keane, 1990). For the current study, pre-treatment and post-treatment CAPS

scores were used.

Posttraumatic Stress Diagnostic Scale (PDS). The PDS (Foa, 1995) is a self-

report measure that assesses posttraumatic symptoms in the past week. This measure

identifies the frequency of each of the 17 posttraumatic symptoms of the DSM-IV, as

well as the extent to which they have impacted various domains of functioning (i.e.,

work, household chores, relationships, fun, school, family, sex, life satisfaction). This

measure has demonstrated strong psychometric properties, such as high internal

consistency (α = .78-.92), and test-retest reliability (r= .77-.85), in addition to convergent

validity with the SCID (Foa, Cashman, Jaycox & Perry, 1997). This measure was

collected at pre-treatment and post-treatment and was a weekly measure of between-

session posttraumatic symptoms.

Client Emotional Arousal Scale-3rd Edition (CEAS-III)-Modified Version.

The CEAS-III (Warwar & Greenberg, 1999) is a measure specifically designed for rating

client emotional arousal as displayed in therapy tapes. It utilizes a Likert scale ranging

from 1 (*person does not express emotions/no arousal*) to 7 (*arousal is extremely intense*

and full in voice & body). In this measure, a rater provides ratings for the peak emotional

arousal (highest emotional arousal intensity) and the modal level of arousal

(overall/average amount of arousal throughout session) for each emotion. The CEAS-III

is designed to measure emotional arousal for 15 different types of emotions (e.g.,

sadness, hopelessness, loneliness, anger, contempt, fear). However, for the purposes of

this study, because tape coders rated therapist and client variables, only sadness, anger,

fear/anxiety were coded to reduce coding overload. Another modification was made for

the current study in that raters also monitored the percentage of the session that the

emotion was displayed. One additional item was also added to this scale to measure client

numbing. Raters coded a "yes" or "no" based on whether the client appeared numb

during the session. If the client did appear numb, raters provided an estimation of the

percentage of the session that this occurred.

Cognitive Processing Therapy Adherence/Competence Revised Form (CPT

Adherence/Competence Form-Revised). The CPT Adherence/Competence Form-

Revised is an extension to the original CPT Adherence and Competence Form (Nishith &

Resick, 1997). The original form is used to assess therapist adherence to certain unique

and essential components of treatment and competence in implementing these skills that are thought to be crucial for CPT clinicians. The revised form includes ratings of therapist variables as well as an added section assessing client behaviors. The "Client Behaviors Section" (Appendix A) was created by the authors of the present study so that CPT tape-raters could also monitor various in-session client behaviors. In the current study, the client behaviors that were used in data analysis included client avoidance of engagement with the therapist and avoidance of engagement with the trauma memory. For the avoidance of engagement with the therapist and trauma memory items, client avoidance was measured on a Likert scale ranging from 0 (*Not at all*) to 7 (*Completely/Extreme*).

Cognitive Processing Therapy Homework Review Form. This homework review measure is a home-grown measure that was created at the Center for Trauma Recovery. Throughout the course of CPT, clinicians assessed client homework by measuring client subjective report of the number of times they worked on an assignment, as well as how helpful they perceived the homework to be. Perceived helpfulness for each assignment was scored on a 5-point Likert scale ranging from 1 (*not helpful at all*) to 5 (*extremely helpful*). This form also includes an item that measures how much time the client spent on each type of homework. This variable was an open-ended measure in which patients reported the number of minutes they spent on each assignment. The CPT Homework Review Form was administered at the beginning of each session.

Procedure

Tape coding. The first step of this project was to identify all client tapes that were eligible for coding. All of the existing session tapes were reviewed to ensure that they had

both audio and video components. Any tapes that were considered "emergency sessions" were removed (10 sessions). Additionally, any tapes for clients who were "removed" from either trial were eliminated from the current study (n=8).

Two master's level graduate students coded all tapes for the project. Because this study was part a conjoint project that includes data about therapist and client variables, the entire revised adherence/competence form was used to code the tapes. To improve inter-rater reliability, the two graduate student raters watched one complete set (12 sessions) of training videos with a CPT expert as the therapist. While watching the tapes, the students met with each other to make any necessary modifications to the rating forms. The students rated the tapes individually, and then assessed inter-rater reliability. To analyze reliability of adherence ratings, Cohen's kappa analysis was used and the raters obtained a 92% reliability rating for this trial phase. For the competence items on the rating form, an Intraclass Correlation Coefficient (ICC) rating was used, and raters obtained a 96% agreement rating for the trial phase.

The next step of tape coding was for each graduate student therapist to rate the tapes from the two parent trials. In total, graduate student A was assigned to code 303 tapes (55% of total tape set) and graduate student B was assigned to code a total of 313 tapes (57% of the total tape set). The expert rater rated 50 tapes (9% of the total tape set). Graduate students A and B overlapped (coded the same tapes) on 65 tapes (12%) of the total sample. The remaining 486 tapes were coded by one graduate student. The expert rater overlapped with 33 tapes for Graduate student A and 17 tapes for Graduate student B. The difference in amount of tapes that the expert rater overlapped was due to random assignment of tapes (and trying to assign client tape sets that included a total of 50 tapes

since that is the amount that the expert rater was hired to code). The tapes were first all randomly assigned to one of the two graduate students. Each client that was assigned had a "primary coder" graduate student. The 65 tapes in which they were assigned to overlap included a secondary graduate student rater. The reason for a primary and secondary coder was to determine which graduate student's data would be used for the correlation analyses. Because each participant's data would be in the data set one time, both coder's data could not be included, so the primary coder data was used. Graduate student A was the primary coder for 48% of tapes and Graduate student B was the primary coder for 52% of tapes. Each coder coded all variables for the sessions they were assigned.

Chart review. Objective client homework data was obtained via chart review. For this review, the number of completed assignments were calculated. Additionally, client progress notes were reviewed to identify any discrepancies from the amount turned in and located in the chart. For example, if the client had no homework in their chart, but the progress note said they completed a specific number of assignments, the assignment was recorded as complete. Because clients varied in number of opportunities to complete assignments based on the number of days between their sessions, this was accounted for in their overall actual homework completed score. For example, clients are assigned one ABC sheet per day in session 2. A patient who has a week before their next session will have seven opportunities to complete this, but a patient with four days before their next assignment has only four opportunities. Thus, the actual homework returned variable was a score based on an average amount of homework completed divided by "homework opportunities."

Results

Participants

The total sample of this study included 70 survivors of interpersonal violence. Of these 70 participants, 60 were female and 10 were male, and 29 were in the variable treatment grant, whereas 41 were in the hypnosis research trail. The sample ranged in age from 19 to 68 (M= 37.01, SD= 11.08). Among the sample, 48.60% (34 participants) were Caucasian, 47.10% (33 participants) were African American, and there was one participant who endorsed being Asian, one who endorsed being American Indian/Alaska Native, and one who reported "Other." Approximately 88.60% (62 participants) of the sample reported that they were not Hispanic or Latino. Over half of the sample was single (52.90%), whereas 28.60% were separated, divorced, or widowed, and 18.60% were married or living with someone. Among the sample, 25.70% had a high school degree or less and 22.80% had a college degree and/or some graduate training. Much of the sample had an income that was less than $20,000 (68.60%). When comparing treatment completers and drop-outs, there were significant differences for education level (completers: M= 14.30, SD= 2.77; drop-outs: M= 12.78, SD= 2.26), income level (Likert scale 1-6 with 1 being less than $5,000/year and 6 being greater than $50,000/year) (completers: M= 3.36, SD= 1.77; drop-outs: M= 2.05, SD= 1.29), and age (completers: M= 38.98, SD= 12.10; drop-outs: M= 33.00, SD= 7.32).

Completers (n=47) and drop-outs (n=23) also differed significantly on the outcome variables (pre-treatment-post-treatment change scores). Post-treatment scores were based on scores from their post-treatment assessment. For participants who did not complete this assessment, their final session PDS and BDI-II scores were utilized.

Specifically, completers had a greater reduction in CAPS scores (*M*= 48.13, *SD*= 22.33)

than drop-outs (*M*=8.00, *SD*= 27.68), greater reduction in PDS scores (*M*=21.22, *SD*=

12.30) than drop-outs (*M*=8.35, *SD*= 10.46), and greater reduction in BDI-II scores (*M*=

17.96, *SD*= 13.40) than drop-outs (*M*=4.59, *SD*= 14.22). Due to these significant

differences as a function of treatment status (completer/drop out), separate analyses will

be conducted based on this variable.

Calculation of Change Scores

CAPS, PDS, and BDI-II change scores were calculated to obtain a measurement

of symptom change throughout the course of CPT treatment. The change score was

calculated using pre-treatment minus post-treatment (when post-treatment was available)

or pre-treatment minus final score (when post-treatment was not available), such that a

larger score meant a greater reduction in symptoms over the course of treatment. Twenty-

one clients did not attend their post-treatment assessment and did not have a CAPS post-

treatment score, so no CAPS change score was calculated for them. Because of this,

analyses also included PDS change scores to measure an additional indicator of change in

PTSD symptoms. For clients who did not have a post-treatment assessment score on the

PDS or BDI-II, a last-observation carried forward (LOCF) technique was used, such that

their final session score was used as their post-treatment score. Twenty-two participants

had their final session score carried forward for the PDS, and 20 carried over their final

BDI-II session score.

Table 2 reveals the descriptive statistics for each of the outcome variables. Scores

on the CAPS, PDS, and BDI-II significantly differed from pre-treatment to post-

treatment (*p's* < .05).

Aim 1: In-Session Avoidance

  Descriptive statistics. To measure in-session avoidance, a number of variables were calculated based on tape session coding. Average avoidance of the trauma memory and average avoidance of engagement with the therapist each included 1 item on a Likert scale (0= *no avoidance* to 7= *extreme avoidance*) for each session coded. Each emotion (i.e., sadness, anger, and fear) was measured on a Likert scale (1= *no emotion* to 7= *extreme display of emotion*). Each emotion (i.e., sadness, anger, fear, numbing) was also rated on the percentage of the session (i.e., 0-100% of the session) in which it was present (i.e., duration). All of these variables was coded for each session. However, for the analyses below, overall averages were calculated across all of the clients' sessions. Specifically, in the analyses, the mode was the mean of the ratings of the average amount of the emotion they displayed during each of the sessions, and the peak was the mean of the ratings of peak intensity they displayed during each of the sessions. Average duration of each emotion and average numbing were measured as the mean of the session duration ratings. Table 3 displays the descriptive statistics for each of these variables based on the graduate students' ratings. This table includes the mean, standard deviation and range for each of the in-session variables.

  When analyzing all of the patient avoidance variables, two ICC ratings were obtained for each variable. Specifically, the correlation between the two graduate student raters' data was obtained, as well as the correlation between one "primary coder" graduate student (see "Tape Coding" section above) and the outside rater. In the literature, there has been a debate about what value constitutes an acceptable ICC between raters (Van Ness, Towle, & Juthani-Mehta, 2008). For example, some have cited

values of .40 to .75 as "fair to good" (Fleiss, 1986), whereas others have recommended values of .75 or greater (Streiner & Norman, 1995).

First, the inter-rater reliability ratings were obtained for all of the variables that were coded, which included avoidance of engagement with the trauma memory, avoidance of engagement with the therapist, and the emotion ratings (e.g., numbing and mode, peak, estimate of percentage of session in which sadness, anger, fear, or "other" emotion was observed). "Other" emotion included any emotion that raters detected that was not specifically listed in the coding sheet (e.g., any emotion other than sadness, anger, and fear). Results revealed an intra-class correlation of .35 between the graduate student coders and a .33 among the graduate student/outside rater coders. Because the raters particularly differed in their estimate of the percentage of the session in which specific emotions were coded, the ICC was calculated again without these ratings, which resulted in an improved ICC rating of .63 (graduate student pair) and .72 (graduate student/expert rater pair). Separate client variables were analyzed independently in an attempt to understand which variables had higher or lower convergence ratings (Table 4).

Possible reasons for the differential reliability ratings will be identified in the Discussion section. However, because of the low reliability ratings for some variables (e.g., avoidance of engagement with the trauma memory and therapist, sadness mode, fear peak, numbness), and the limited variability of ratings (see Table 3 above), results of the in-session avoidance variable analyses must be interpreted with caution.

Hypothesis testing. Hypothesis 1 predicted that client avoidance of in-session engagement of the trauma memory and avoidance of engagement with the therapist would be associated with a significant portion of the variance of change in PTSD and

depression symptom scores from pre- to post-treatment/final score. Specifically, it was hypothesized that the higher the avoidance ratings, the less symptom change should occur (negative relationship). However, according to hypothesis 2, the more emotion (i.e., sadness, anger, fear) the clients displayed, the more symptom change should occur (positive relationship). Finally, sub-hypothesis 2b stated that the more numbing that occurred, the less symptom change would occur (negative relationship).

Kolmogorov-Smirnov (KS) tests were completed and all of the variables, except avoidance of engagement with the therapist among drop-outs did not meet the assumption of normality ($p<.05$). Due to this lack of normality, one-tailed Spearman's rho correlations were conducted rather than Pearson's correlations because non-parametric statistics are more appropriate for non-normally distributed data. Because completers and treatment drop-outs significantly differed on their outcome scores, these analyses were conducted separately.

Results for treatment completers. First, correlations were completed to clarify the relationship between in-session avoidance variables and symptom change (Table 5). No correlations for duration of emotions (percentage of session) were included due to the poor inter-rater reliability ratings on most of these variables. Given the low interrater reliability for the in-session avoidance variables, correlations were calculated for overall coding based on a composite of the raters scores ($n = 70$) as well as for the ratings exclusively by the expert rater ($n = 6$) to see if correlations were stronger when the avoidance variables were judged by an experienced expert in the field. The outside rater did not have any data for treatment drop-outs because each of the participants she rated were treatment completers. Thus, tables with treatment drop-outs' data only include one

correlation coefficient. The results from the expert rater data should be interpreted with caution. They are only based on data from 6 clients, and were included for exploratory reasons. They are underpowered, as Spearman's rho requires at least 23 participants to detect a small effect (Faul, Erdfelder, Buchner & Lang, 2008). The correlations among graduate students are of adequate power to detect a small effect.

To test hypothesis 1, in-session avoidance of the trauma memory and avoidance of engagement with the therapist were coded such that higher scores were given to those who were more avoidant. Thus, a negative relationship was expected between avoidance and symptom change scores. Among graduate student data for completers (Table 5), in-session avoidance of the trauma memory was significantly negatively correlated with CAPS change scores ($r_s = -.27$, $p<.05$), but not PDS change scores ($r_s = -.06$, $p>.05$) or BDI-II scores ($r_s = -.11$, $p>.05$). Among the expert rater data, avoidance of the trauma memory was significantly negatively correlated with CAPS change scores ($r_s = -.75$, $p<.05$) and PDS change scores ($r_s = -.75$, $p<.05$) but not significantly correlated with BDI-II change scores ($r_s = -.61$, $p<.05$). However, the avoidance of the trauma memory variable was not significantly related to outcome based on the graduate student data ratings when using a two-tailed Spearman's rho correlation analysis. In-session avoidance of engagement with the therapist was not significantly correlated with any of the symptom change scores (CAPS= -.14, PDS= -.21, BDI= -.16, $p's > .05$) for the graduate student data. Among the expert data, avoidance of engagement with the therapist was significantly and negatively related to change in CAPS scores ($r_s =-.76$, $p<.05$), PDS scores ($r_s = -.89$, $p< .01$) but not significantly correlated with change in

BDI-II scores ($rs = -.70$, $p>.05$). Effect sizes based on the expert rater data were large, but effect sizes were small for results based on the graduate student ratings.

Next, to test hypothesis 2, data related to the average mode and peak intensity of various emotions (i.e., sadness, anger, fear) were analyzed to assess the relationship with the symptom change scores (Tables 6-8). Among completers, none of the sadness or anger mode or peak scores as rated by graduate students were significantly correlated with the CAPS, PDS or BDI-II change scores (all $p's > .05$). Among graduate student data, the effect sizes were small. However, for graduate student data, the average fear mode was significantly and negatively correlated with CAPS ($rs = -.32$, $p<.05$) and BDI-II change scores ($rs = -.31$, $p<.05$) and had medium effect sizes. This relationship was not significant among PDS scores ($rs = -.23$, $p>.05$) which had a small to moderate effect. However, one should note that these correlations are in the opposite direction of what was hypothesized. Among the expert rater data, no mode scores for anger or fear could be calculated due to the lack of variability. No significant correlations were found for sadness mode or peak scores, but a large effect size was found for the mode score of sadness in relation to CAPS change ($rs = .52$) and BDI-II change ($rs = .70$) and the peak score of sadness in relation to BDI change ($rs = .71$). Contrary to what was hypothesized (e.g., a positive correlation), the expert rater found significant and negative correlations for anger peak in relation to PDS ($rs = -.75$, $p<.05$) and BDI ($rs = -.99$, $p<.05$) change scores, and effect sizes were large. A significant and positive relationship was found between average fear peak and BDI-II change score ($rs = .78$, $p<.05$). No significant relationship between average fear peak for CAPS or PDS change scores was found

among the expert rater, but a moderate effect was detected with the PDS change score (r_s = .43).

When assessing numbing among the completers (Table 9), no significant results were obtained for the graduate student (r_s =.19, r_s =.17, r_s =.01, p's >.05) or expert rater data (r_s =.23, r_s = -.73, r_s = -.64, p's >.05); thus hypothesis 2a was not supported. However, there was a large effect size for the expert rater data numbing scores on the PDS and BDI-II change scores, suggesting that the nonsignificant findings were again likely due to sample size.

Results for treatment drop-outs. Next, correlations of avoidance of trauma memory and avoidance of engagement with the therapist were completed among treatment drop-outs (Table 10). For these correlations, only the PDS and BDI-II change scores were used because most drop-outs did not complete post-treatment CAPS assessments. Among drop-outs, avoidance of the trauma memory was not significantly correlated with PDS change scores (r_s = -.36, p>.05), or with BDI-II change scores (r_s = -.01, p>.05). However, the effect size among trauma memory avoidance and the PDS change score was large but nonsignificant, possibly due to the small sample size. Avoidance of engagement with the therapist was significantly and negatively related to PDS change scores (r_s = -.53, p<.01) and had a large effect size, but was not significantly correlated with BDI-II scores (r_s = -.22, p>.05).

Analyses assessing the relationship between emotional engagement (i.e., sadness, anger, fear mode and peak) were duplicated among treatment drop-outs (Tables 11-13). Among these clients, only the fear mode variable was significantly correlated with the PDS change score (r_s = -.45, p<.05).

Analyses were conducted assessing average numbing among treatment drop-outs (Table 14). Results revealed that the numbing variable, was not significantly correlated with PDS (r_s =.01, p>.05) or BDI-II (r_s =.02, p>.05) change scores and effects were minimal.

Aim 2: Homework Compliance

Hypothesis 3 anticipated that the client subjective report of amount of homework completed (Likert scale ranging from 1 (*not at all*) to 5 (*more than 10*) of client reports of number of times they used homework assignments), actual amount of homework returned to session, client report of how helpful the assignments were, and time spent on homework throughout the course of CPT would significantly and positively predict change in PTSD and depression symptoms. Specifically, the more homework completed, more helpful the assignments were, and the more time spent completing homework would lead to a greater reduction in these symptoms. Again, symptoms were measured from pre-treatment to post-treatment/final session, so a larger change score indicates a greater reduction in symptoms throughout treatment.

Two outliers (clients who reported an average of 540 and 362 minutes per assignment) were removed. Kolmogorov-Smirnov (KS) tests were completed and resulted in a failure to reject the null hypothesis (*p's* < .05) for the average amount of homework returned and average homework minutes (among completers) as well as subjective report of homework amount (among drop-outs). To allow for analyses of the non-normal data, one-tailed Spearman's rho correlations were conducted as a non-parametric alternative. Power analyses indicate that a sample size of 23 is needed to conduct this analysis and detect a small effect (Faul et al., 2008). Therefore, the analyses

of completers ($n = 44$) is adequate to detect this effect. The analyses with the drop-outs were under-powered and had between 9-17 participants who were included in the correlations, so these correlations must be interpreted with caution. There were 23 drop-outs in the study and some did not stay past session 1, so they never had the opportunity to complete homework. Moreover, those who did not complete homework did not rate how helpful it was, so those analyses have a smaller sample size ($n=10$). Because treatment completion status significantly predicted the outcome variables, separate completer analyses were utilized. First, correlations were analyzed for treatment completers (Table 16).

Among completers, average homework amount ($rs= .17, .07, .13$) average subjective report of homework amount ($rs = -.04, -.01, .12$), and average homework minutes ($rs = -.07, .01, .00$), were not significantly correlated with any of the symptom change scores (CAPS, PDS, BDI-II, respectively; $p's>.05$). All effect sizes were small. However, average perceived helpfulness of assignments was significantly correlated with change in CAPS ($rs = .36, p<.01$), and PDS ($rs = .34, p<.05$) such that higher ratings of perceived helpfulness were correlated with a greater reduction in PTSD symptom scores from pre-treatment to post-treatment. Effect sizes were in the moderate range. However, average homework helpfulness was not significantly positively correlated with BDI-II change scores ($rs = .17, p>.05$) and was a small effect.

Next, correlations were completed for drop-outs (Table 17). It should be noted that few drop-outs ($n=4$) returned to the post-treatment assessment session, so CAPS change scores (pre-post treatment) were not included in the analysis due to the limited

sample size. The PDS and BDI-II change scores allowed for a larger sample because they utilized last observation carried forward (LOCF) techniques to account for missing data.

Among drop-outs, average homework returned (rs = -.04, -.04), average subjective amount of homework (rs = -.12, -.17), and average perceived helpfulness (rs = .30, .04) were not significantly correlated with the symptom change scores (PDS and BDI-II, respectively; $p's$>.05). Most effect sizes were small, but the relationship between average helpfulness and PDS change was of a moderate effect size. It likely was nonsignificant due to the sample size. Average homework minutes was not significantly correlated with change in PDS scores (rs = -.43, p>.05), but was of a moderate effect size. However, average minutes was significantly correlated with change in BDI-II scores (rs = -.81, p<.01), such that more minutes spent on assignments was correlated with less change in depression scores throughout treatment. This finding has a large effect size. These results should be interpreted with caution, however, due to the small sample size (n=13). It is a small sample size because 6 of the 23 treatment drop-outs did not attend more than one session, and thus, would not have any homework data.

Secondary analyses.

Subjective vs. objective amount of homework. Secondary analyses were conducted to assess the relationship between the two measures of homework amount. The amount of homework returned (objective measurement) was the number of homework assignments clients physically returned to the session (corroborated via chart review). The subjective report of homework was the amount of homework that clients reported doing regardless of whether they brought it to session (measured at the beginning of each session during the check-in). Amount of homework returned was a continuous variable

that did not use a Likert scale whereas subjective homework amount was based on a

Likert scale (1= *no homework* to 5= *more than 10 assignments*). When these two scores

differed, clients often reported that it was because they forgot to bring the assignments to

the session, or that they misplaced them after completing them. However, a mismatch

also could have been due to therapist error if the therapist did not place the homework in

the client's chart. To reduce the likelihood of this error, progress notes were reviewed and

if the progress note stated that the client did ___ homework worksheets, this number was

recorded rather than the chart data because it is likely that the therapist did not place the

assignment in the chart. These variables were analyzed for each homework assignment

throughout the course of CPT (Table 18), and clients were deemed to have a "match,"

which was a consistent report of their homework; an "under report," which meant they

reported doing less than they actually turned in; or an "over report," in which they

reported doing more than they turned in. For these analyses, the entire sample (N=70)

was included.

As one can see from Table 18, overall, the homework that was returned and the

client subjective report of homework generally tended to be consistent, or "match."

However, the amount of homework that was over reported ranged from 13.21% (ABC

worksheets) to 44.44% (CBWs). This may indicate that clients completed more

homework than what they turned in during their therapy sessions.

Completion of impact statements and trauma accounts. Because the impact

statements and trauma accounts were measured dichotomously, as either completed or

not completed, no comparison between subjective and objective reports were obtainable.

Instead, data was collected assessing the number of times that clients "thought about or

worked on" each of these assignments, based on a Likert scale (1= *not at all*, 2= *less than 2 times*, 3= *2-5 times*, 4= *6-10 times*, 5= *more than 10 times*; Table 19). Data were included for the entire sample (N=70).

Overall, although these assignments only needed to be completed once, clients reported thinking about them or working on them multiple times throughout the week (typically 2-5 times). Also notable was that of the 12 clients who did not complete the trauma account in session 4, six did complete it in session 5. However, eight participants who had completed the account in session 4, did not complete it for session 5. The majority of these participants, who completed it the first time (session 4) but not the second time (session 5), rated the initial assignment as "not helpful at all" (25.00%) or "a little helpful" (50.00%).

Actual amount of homework. An additional analysis was conducted to assess the percentage of homework assigned that the clients completed and returned to the session. Once again, amount of homework was calculated based on the total amount of homework done divided by the amount of homework opportunities to do homework. For example, if a client had 5 days between their session, but completed 7 worksheets, their score would be 7 (homework done) / 5 (opportunities) = 140%. However, if a patient had a week between the session and only completed 2 worksheets, they would score a 2/7= 28.57%. Table 20 represents the average amount of each assignment that was completed and returned to sessions. For example, the first ABC worksheet had a mean of .84, indicating that participants completed 84% of the assigned homework on average. Table 20 also shows the percentage of clients who attempted each assignment (i.e., completed at least 1 worksheet).

***Perceived helpfulness of assignments*.** Perceived helpfulness of assignments was monitored throughout each session for each assignment for the entire sample (Table 21). Clients rated each assignment on a Likert scale from 1 (*not helpful at all*) to 5 (*extremely helpful*). Results for each assignment are displayed in Table 21. On average, the final Challenging Beliefs Worksheets due in session 12 (intimacy module) were perceived as the most helpful (*M*= 3.88, *SD*= .72), followed by the final impact statement (*M*= 3.76, *SD*= .83). Clients rated the initial trauma account due in session 4 as the least helpful assignment (*M*= 2.76, *SD*= 1.36).

***Treatment status*.** Overall averages of these homework variables were calculated. Throughout the course of CPT, treatment completers completed approximately 58% of the homework whereas drop-outs completed an average of 47%. In regards to time spent on homework, completers spent an average of 67 minutes per assignment, whereas drop-outs typically spent about 93 minutes per assignment. Completers' helpfulness rating was an average of 3.28 (*SD*= .67) and drop-outs had an average of 2.99 (*SD*= .99). Comparisons between treatment completers and drop-outs could not be completed for homework variables due to the limited sample size among drop-outs (*n*'s ranged from 10-14 on these variables). A sample size of 44 participants per group is required to detect an effect in a Mann-Whitney U test (Faul et al., 2008).

Aim 3: Attendance

Hypothesis 4 predicted that client compliance with session attendance (percentage of scheduled sessions that were attended) and irregularity of sessions (average number of days between appointments) throughout the course of CPT would be associated with change in PTSD and depression symptoms in a positive and negative direction,

respectively. Specifically, it was anticipated that the more compliant participants were with attending their scheduled sessions, and the fewer days between sessions (e.g., more regular attendance), the greater the reduction in PTSD and depression symptoms.

One treatment drop-out took an extended break from therapy and then resumed, so this client was an outlier and removed due to an unusually large average number of days between treatment (52 days between each session due to the break). Kolmogorov-Smirnov (KS) tests were completed and resulted in a rejection of the null hypothesis (p's $< .05$), thus violating the assumption of normality for the attendance compliance (drop-outs) and irregularity variables (completers). Therefore, Spearman's rho one-tailed correlations were utilized as a non-parametric alternative. Again, because completers and treatment drop-outs significantly differed on their outcome scores, these analyses were conducted separately. The correlations require a sample size of 23 (Faul et al., 2008). Treatment completer analyses were adequately powered ($n = 45$). Treatment drop-outs were nearly adequately powered for analyses using the attendance compliance variable ($n = 22$), but only 15 participants had data for the attendance irregularity variable (because some participants only had 1 session, no irregularity variable could be obtained because there were not 2 sessions with days in between). Thus, correlations including this variable among drop-outs should be interpreted with caution.

First, correlations were completed to clarify the relationship between attendance variables and symptom change (Table 23). Among completers, attendance compliance was not significantly correlated with CAPS change scores ($r_s = .05$, $p > .05$), PDS change scores ($r_s = -.10$, $p > .05$), or BDI-II scores ($r_s = -.09$, $p > .05$). Similarly, attendance

irregularity was not related to CAPS scores (r_s = -.23, p>.05), PDS scores (r_s = -.12, p>.05), or BDI-II scores (r_s = -.03, p>.05). All effect sizes were very small.

Next, these correlations were completed among treatment drop-outs (Table 24). For these correlations, only the PDS and BDI-II scores were used, because most drop-outs did not complete post-treatment CAPS assessments. Among drop-outs, attendance compliance was not significantly correlated with PDS change scores (r_s = -.27, p>.05), or BDI-II scores (r_s = -.25, p>.05). Similarly, attendance irregularity was not related to PDS scores (r_s = -.10, p>.05), or BDI-II scores (r_s = .08, p>.05). Effect sizes for the attendance irregularity variable were small. However, the relationship between attendance compliance and PDS and BDI-II scores have small-moderate effect sizes, suggesting that the non-significant results for that analysis may have been due, in part, to the small sample size.

Average number of sessions attended & missed. Additional exploratory analyses were conducted to further understand these attendance variables. Most patients were compliant with attending their scheduled sessions. Among completers, clients attended 78% of their scheduled sessions on average (M= .78, SD= .17) and treatment drop-outs attended 85% of their scheduled sessions on average (M= .85, SD= .22). However, few participants kept all of their appointments. Only 17 (26.56%) had no missed sessions, 9 of which were treatment completers and 8 of which were treatment drop-outs. Completers attended an average of 11.23 sessions (SD= 3.29) and drop-outs completed an average of 3.22 sessions (SD= 2.43). When clients missed their sessions, they tended to cancel their sessions more frequently than no-show them. Exploratory analyses found that of the 189 missed sessions of treatment completers, 73.54% were cancelled (139 sessions

cancelled, 50 no-showed). Among drop-outs, among the 36 missed sessions, 63.89%

were cancelled (23 sessions cancelled, 13 sessions no-showed). Completers tended to

have an average of 8.94 days (*SD*= 3.41) between sessions, whereas drop-outs had an

average of 7.74 days (*SD*= 4.01) between sessions.

Session-by-session analysis of attendance. Table 25 presents the number of

sessions that clients completed. Most participants completed 12 or fewer sessions (90%

of the sample), but because clients from the Variable Treatment grant, which allowed for

up to 18 sessions, were included, some participants had more than the typical 12 sessions.

In this grant, they were also considered completers when they met a specific cut-off point

of a PDS $\leq$ 20, BDI-II $\leq$ 18. Thus, some participants were considered treatment

"completers" with less than 12 sessions. Many of the participants who dropped out of

CPT did so within the first two sessions (approximately 60%). Over 90% of the clients

who dropped out did so before session 7.

In an effort to understand which CPT sessions were missed most frequently,

session-by-session frequency data were calculated to assess the percent of clients that

missed each CPT session, but later re-scheduled the appointment and attended that CPT

session (Table 26). For example, for session 1, 13 patients originally missed the

appointment (missed column) and later re-scheduled and attended. The entire sample of

70 participants completed the session eventually (total clients column). Thus, the

percentage who originally missed the appointment was 13/70= 19% (% column).

The sessions that had the highest percentage of participants miss the session were

sessions 17 (60%) and 16 (40%). However, only 5 participants made it that far in CPT, so

this is a limited sample size. Sessions 1-12 had larger sample sizes for the number of

participants, with at least 30 participants for each of these sessions. Among the typical CPT protocol sessions, session 7 had the highest percentage of clients who missed the appointment (36%), followed by sessions 6 and 9, each of which had 31% of the clients missed this session. Of the typical CPT sessions, the session with the highest compliance of attendance was session 12, with only 12% missing the appointment.

Discussion

The current study aimed to understand the relationship between in- and out-of-session avoidance process variables throughout the course of CPT in relation to posttraumatic and depressive symptom outcome. Previously, many studies have neglected to assess the role of in-session avoidance, homework noncompliance, and inconsistent and irregular therapy session attendance in relation to treatment outcome. This is the first known study to address all three of these variables among clients engaged in CPT. By furthering our understanding of these variables, the field can improve the current treatments to benefit survivors of trauma.

In-Session Avoidance

With the recent shift of the conceptualization of PTSD in DSM-5 (APA, 2013), it is essential to understand the role of in-session avoidance on treatment outcome. Previous research has begun assessing the impact of attendance on treatment outcome. Because most previous research has attempted to understand avoidance by measuring it between sessions via self-report questionnaires, this study focused on avoidance that occurs within the therapy room. Other approaches that have been taken to measure in-the-moment avoidance include measuring physiological non-responsiveness when completing a

trauma-related monologue activity or when viewing pleasant and aversive images. The only prior method of measuring emotional engagement during a therapy session is through the use client-reported SUDS ratings. However, no known studies have assessed effortful avoidance of engagement during therapy sessions. Yet, theoretically, these avoidance symptoms should play a role in treatment outcome, such that the more one engages in effortful or emotional avoidance, the less one would benefit from treatment because one is not activating the trauma memory and integrating new information.

The current study aimed to measure effortful and emotional avoidance based on coding variables from CPT sessions. The CEAS-III was modified and added as a supplement to the Revised CPT Adherence and Competence Form to measure potential emotional avoidance based on coder ratings of session video tapes. Additionally, two variables were added to measure in-session effortful avoidance (i.e., avoidance of engagement with the trauma memory and avoidance of engagement with the therapist).

First, it is important to address the fact that the inter-rater reliability coefficients among some variables (e.g. avoidance of engagement with the trauma memory, avoidance of engagement with the therapist, sad mode ratings, anger mode ratings, and fear mode and peak ratings) were not adequate to detect meaningful results. The CEAS-III was developed as a process measure of client emotional arousal to evaluate the intensity of observable client emotion from therapy tapes. On this scale, an emotional response is coded when a client acknowledges feeling an emotion or visibly demonstrates an emotional response. Typically, this is measured through nonverbal behaviors (i.e., covering one's head in shame) or vocal quality (e.g., change in pitch or volume; Warwar & Greenberg, 2000). The authors of this scale specify that the purpose of the scale is to

measure emotional responses despite their function, or whether they are adaptive to the therapy session. The original scale included 15 emotions that could be coded, but the current study was modified to measure sadness, anger, and fear/anxiety. Several issues stand out as potential reasons for the problematic inter-rater reliability.

On this scale, the primary way one codes the emotional intensity (peak), or mode of the emotion, is by using a Likert scale that assesses many vocal qualities (e.g., change in speech or volume, arousal in voice, fragmented/broken speech patterns). Although these qualities are helpful to determine the presence and intensity of an emotion, it may be difficult to assess minor changes that occur throughout an entire 60 minute therapy tape. It is also possible that different aspects of arousal were weighted differently by different coders. For example, one coder may have attended more closely to speech volume while another attended more to arousal in the voice. Further, while coding the tapes, a large number of variables were attended to, so each emotional response was one of many factors being assessed. Watching tapes while coding for emotional arousal in isolation would likely lead to a more focused approach that may have had more reliable findings. Additionally, perhaps watching tapes in shorter segments and coding segments of the tape separately would have been more beneficial, rather than summing up the entire therapy session with one peak and one modal rating. Other therapy tape rating scales, such as the Therapeutic Collaboration Coding System (TCCS), has taken this approach by breaking the therapy session into measurable segments and recording data for each segment by monitoring moment-by-moment therapist and client interactions (Ribeiro, Ribeiro, Goncalves, Horvath & Stiles, 2012).

The modifications that the current study made to the original CEAS-III likely also contributed to the lack of inter-rater reliability. For example, the current study added a variable that measured the duration of emotions (sadness, anger, fear/anxiety). Because the possible values for the duration of the session ranged from 0% of the session to 100% of the session, this introduced a difficult task for raters because it required a rater to attend to each emotion moment-by-moment throughout the entire tape and introduced more potential for rater error.

Of note, the raters who coded these therapy tapes also coded therapist variables within the CPT sessions based on the standard CPT Adherence/Competence Form. Interestingly, among the therapist variables, the levels of agreement were .89 between the graduate students and .92 between the outside rater and graduate students (Farmer, Mitchell, Parker-Guilbert & Galovski, 2016). However, when rating client factors, the interrater reliabilities dropped dramatically. Although many of the reasons for this were described above, it is interesting that trained therapists had an easier time agreeing on desirable therapist behaviors, but had greater difficulty interpreting the meaning of client behaviors. This may speak to the complex nature of observing someone else and deciphering the implications and motivation of the observed behavior. For example, if clients clench their fists while speaking about the traumatic event, the raters must determine if this indicates that they are anxious or angry, which may vary by rater. Similarly, one person may interpret a quiet client as anxious, whereas another rater may suspect that the client is dysthymic, and another may interpret this as the client being euthymic or calm. Therapists also may have different definitions of in-session avoidance of the memory and of engagement with the therapist. Most clients did not display

significant avoidance behaviors that would be obvious, such as not responding, or distracting themselves by looking at a clock or their phone. Therefore, in-session avoidance likely consisted of more subtle forms of avoidance that are difficult to identify.

A limitation of the tape coding procedure was that some of the tapes were recorded so that they only showed the therapist. In these cases, the rater was not able to view the client. Also, it can be difficult to attend to vocal tone and quality when listening to a tape, given that the sound quality can vary, which could have hindered many findings of emotional arousal because the CEAS-III rating scale emphasizes using aspects of the client's voice to detect emotions.

Although the inter-rater reliability ratings were poor among some variables, correlations were still analyzed to explore the data further. However, the findings must be interpreted with caution. Because the inter-rater reliability was so poor, we ran exploratory analyses examining the correlations based on ratings conducted only by expert rater to see if the results were enhanced when the tapes were coded by an unusually experienced clinician. Indeed, the correlation coefficients were much higher when using the expert's ratings than when using the graduate students' ratings (even though the graduate students were both experienced CPT clinicians), suggesting that future studies may want to rely on ratings from long-time experts in the field in order to ensure the best possible data. Unfortunately, for this study, the expert rated tapes for only seven participants, so the small sample size precluded any clear conclusions. Thus, here we discuss only the results of the graduate student ratings (based on 550 tapes).

Among these ratings for completers, avoidance of the trauma memory was negatively correlated with the CAPS change score. This was consistent with the hypothesis that the more avoidant one is related to the trauma memory, the less benefit she or he will experience from treatment. Among the emotion variables, only the average fear mode was significantly negatively related to change in CAPS and BDI-II. The negative direction of the correlation was unexpected, but perhaps may indicate that those with greater fear were less likely to have their fear habituate over the course of treatment, thus leading to less decline in their posttraumatic and depressive symptomatology.

Among drop-outs, no significant correlations were found. Interestingly, however, the drop-outs tended to have larger effect sizes than the treatment completers for the emotion variables. It is possible that those that are avoiding, and thus are failing to progress in treatment, are more likely to drop-out. However, all of these results are limited in the extent to which they can be interpreted due to the lack of variability in ratings. It is likely that more significant and larger effect sizes would have been found if these variables had a greater range of scores.

As can be seen in the descriptive statistics table (Table 3), there was very little variability observed on the tapes for all of the variables. For example, among completers, the raw scores for coded emotions were highly skewed, such that on a Likert scale ranging from 1 (*no emotions*) to 7 (*extreme display of emotion*), all mean scores were a 1 or 2. Similarly, for the average scores for avoidance of the memory and engagement with the therapist, which were rated from 0 (*not at all*) to 7 (*extreme avoidance*), the mean scores of the skewed raw data were .64 and .36, respectively. These results demonstrate

clear floor-effects; very little in-session avoidance and very few displays of emotions were coded.

Another potential factor that may have influenced the results of the emotion correlations is the focus of the current study. The raters were rating emotional engagement with the goal of identifying how emotional avoidance impacts treatment outcome. The original purpose of the CEAS-III is to rate an emotional display without evaluating its function. However, some clients display emotion as a way to avoid during the therapy session. For example, some clients may use anger to avoid feeling other primary emotions, such as sadness. Without taking the context into account, this measure may not be the most valid approach to measuring true emotional engagement *in opposition to* emotional avoidance. For example, in the current study, anger may have been coded as a sign of emotional engagement, when it indeed was an avoidance strategy.

Finally, among both completers and drop-outs, the numbing variable did not have a significant effect on treatment outcome. This variable was not explicitly operationalized within the coding manual, which is a limitation. The lack of specific examples of what is meant by numbing may have led to infrequent detection among the raters; indeed, this inter-rater reliability for the coding of the numbing variable was particularly low. The expert rater coded this variable more frequently than the graduate students of this variable, likely due to more clinical experience and a clearer understanding of the concept of numbing and the behaviors associated with it.

Overall, based on the theory that avoidance maintains the symptoms of PTSD and based on clinical experience, it is still likely that avoidance of in-session engagement

negatively contributes to therapy outcome. This study represented a first-step in trying to identify these variables within the context of CPT, and future studies should continue to measure these. Perhaps future studies should have more of a focus on patient report of their emotions as they experience them. For example, some tape-coding studies have utilized a coding strategy in which "emotion episodes" (Greenberg & Korman, 1993) is conducted. In this system of coding, an emotion episode consists of a client reporting a situation and the emotion that followed. Some studies have identified emotion episodes within therapy tapes and then assessed for the emotional intensity of that specific episode, rather than focusing on the entire therapy session as a whole (Missirlian, Toukmanian, Warwar & Greenberg, 2005). Thus, this approaches combines subject client report with therapist observation. Therefore, this could be a strategy implemented in future studies that could assist with clarifying when emotion is displayed; in another study this approach demonstrated a higher inter-rater reliability rating of .99 (Pos, Greenberg, Goldman, & Korman, 2003), as compared to the CEAS-III, which typically has lower reliability ratings (e.g., modal rating= .70, peak= .73; Warwar & Greenberg, 2000). Similarly, future studies could expand upon the effortful avoidance variables by providing additional behavioral anchors to try to identify in-the-moment avoidance. For example, some clients may avoid engagement with the trauma memory by stating that they do not want to talk about the event, and may avoid engagement with the therapist by shrugging instead of providing a verbal response, not responding at all, or appearing guarded (e.g., stating or indicating that they do not trust the therapist or do not feel comfortable revealing information).

Furthermore, as with any therapy coding study, more intensive training with the coding system would likely result in higher reliability ratings. Given the finding that treatment drop-outs had higher effect sizes for the relationship between in-session avoidance and symptoms change, it may be the case that those who are avoiding more may be more likely to drop out of treatment. Thus, future studies may benefit from combining treatment completers and drop-outs to assess the relationship between in-session avoidance and treatment outcome because separating them may obscure the results.

Homework Completion

Although a few researchers have pioneered studies analyzing the impact of homework compliance on treatment outcome, unfortunately, there remains a dearth of literature on this topic. Further, much of the research conducted to date has been within PE studies. Among these studies, results remain equivocal, thus preventing any clear conclusions. Moreover, much of the difficulty with interpreting the varying results of these studies has been due to the fact that the operationalization of "homework compliance" tends to vary from study to study.

Theoretically, homework completion should be an essential component of the therapy process. Information processing theory posits that the fear network needs to be activated in order for new learning and habituation to take place. Similarly, cognitive theory posits that a client needs to engage with the trauma memory to alter maladaptive beliefs and allow for natural affect to ameliorate. Because the typical patient spends 60-90 minutes in session each week, with the remaining 167 hours out of session, it seems imperative that the client gain repeated practice with trauma-related material.

The current study added to the literature by assessing various aspects of homework compliance (i.e., amount of homework, time spent on homework, perceived helpfulness). Hypothesis 3 anticipated that the amount of homework that was completed, time spent on homework, and perceived helpfulness of assignments would predict a reduction in PTSD and depression throughout the course of CPT. However, findings revealed that only perceived helpfulness predicted change in PTSD (when measured by the CAPS), but even homework helpfulness did not predict change in depression. To our knowledge, few studies have assessed these specific relationships. van Minnen and Hagenaars (2002) studied homework completion by measuring the number of times patients completed listening to the imaginal exposures between the first and second sessions of PE; however, there was no significant difference between those who were considered "improvers" from those who were "non-improvers" throughout the therapy. In contrast, Mueser and colleagues (2008) measured the percentage of homework completed throughout the entire course of CBT for PTSD, and did find a significant reduction in symptoms as measured by the CAPS. The current study is similar to the Mueser et al. study because both studies utilized the CAPS to measure change in symptoms, and both measured homework compliance throughout the entire course of treatment rather than across a few sessions. However, the current study did not find significant relationship between amount of homework completed and change in symptomatology. This is the only known CPT study to assess this relationship. One explanation for the lack of findings could be that, as clients improve on their homework skills, they may began to utilize these skills mentally without writing them on a worksheet. This is an ultimate goal for therapy, and this could have impacted the results if those who truly understood the

assignments and used them mentally improved throughout the treatment. Future studies should replicate these findings to provide further clarification.

The finding that perceived helpfulness predicted change in PTSD is newer to the literature. Little research has been conducted to understand this aspect of homework compliance. In a study of general outpatient CBT treatment, Fehm and Mrose (2008) found that patient attitude about homework did not relate to a higher commitment to homework throughout treatment. However, a recent PE study by Bluett, Zoellner, and Feeny (2014) analyzed the patient SUDS levels during PE imaginal exposures in relation to change in PTSD. This study found that the perceived helpfulness of listening to the imaginal exposure tape for homework had a significant effect on reduction in PTSD symptoms. In both the current study and the Bluett and colleague study (2014), perceived helpfulness did affect change in PTSD symptoms. Perhaps these findings are more unique to PTSD patients than to a general population of outpatient clients as assessed in the Fehm and Mrose (2008) study. Although this finding is still new to the literature, it emphasizes the importance of patients identifying the benefit of the homework in helping them to reach their treatment goals. Huppert and colleagues (2006) and Fehm and Mrose (2008) suggested improving homework compliance by providing a clear rationale for the assignments, relating the assignments to patient goals, creating assignments in a collaborative manner, and providing written instructions to aid clients in having success with practice work. Given the finding that clients' perceptions of helpfulness of assignments was the only significant homework-related predictor of change in PTSD symptoms in this study, these suggestions become all the more helpful in enhancing patient perception of homework and ultimately influencing treatment outcome.

Interestingly, on average, assignments were viewed as increasingly helpful during subsequent times clients completed them. This finding is promising because it shows that, over time, clients were likely able to comprehend the purpose of the assignments and thus find them beneficial, even with the most difficult assignments such as the trauma accounts. This finding may also reveal increased perceived helpfulness as clients gain mastery over the skills. It is possible that the first time the clients worked on these skills, they may have had more difficulty, but over time, they became more proficient and found the skills to be helpful. However, this relationship may be bidirectional, such that, as improvement in symptoms occurs, clients may begin to perceive the homework as more helpful.

Although time spent on homework was measured, it did not have a significant relationship to change in PTSD symptoms. Previous research (Lee et al., 2002) studied a mixed Stress Inoculation Training (SIT)/PE protocol and found that patients only completed about 40 minutes of homework per assignment despite being assigned to spend an hour on each assignment. Although patients only spent about 66.67% of the time they were supposed to spend, the researchers still found significant reductions in PTSD symptoms. Participants in the current study spent an average of 74 minutes per assignment, but time spent did not predict change in PTSD symptoms. The current study's finding was contradictory to Hypothesis 3, but it may be explained by the idea that it may be the quality of the time spent on the assignment rather than the quantity of time spent that creates change. Clients could spend a significant amount of time working on the skills, yet if they do not understand them or if they are engaging in avoidance strategies while doing the worksheets, the homework will likely be of little benefit.

A surprising finding was that patient amount of homework, perceived helpfulness, and time spent on assignments were not significantly correlated with change in depression for completers, and only average homework minutes was related to depression among treatment drop-outs. Even more interesting, this relationship among drop-outs was in the opposite direction of what was hypothesized. The more time that drop-outs spent on homework, the smaller the decrease in depression symptoms. Unfortunately, no previous studies were found that analyze the relationship between homework compliance and change in depression throughout the course of PTSD treatment. Empirical evidence from PTSD outcome studies (e.g., Liverant, Suvak, Pineles, & Foa, 2012) and anecdotal clinical evidence tend to support the notion that, as PTSD symptoms decline, depression symptoms often decrease as well. Perhaps in the current study, the clients that had more difficulty understanding and completing homework were the ones who dropped out of treatment. If this is the case, they may have spent an inordinate amount of time working on the assignments, without finding them helpful. Moreover, some clients may have ruminated while completing the assignments, which could lead to increased homework time and increased negative affect, thus accounting for the increased depression symptoms. Future studies should seek to replicate and further explain this finding.

When analyzing the amount of homework that all of the patients did throughout the course of CPT, participants only completed slightly over half of their assignments. On a positive note, this finding is promising because it shows that, despite the fact that patients only did slightly over half of the assignments on average, their symptoms declined. This was especially true when they perceived the assignments as helpful. This shows the robust nature of CPT treatment and may point to the importance of the in-

session work that is conducted. If patients are changing their stuck points in-session, perhaps not completing daily worksheets is not necessary for a positive change process to occur. Moreover, this is promising for the many patients who report that they do not have the time to do homework. Moreover, perhaps the dose of homework required to see improvements is not the typical every day assignment that is currently the standard in the CPT protocol.

An interesting exploratory finding was that most clients appeared to have an accurate "match" between their subjective report and actual, observed amount of homework turned in. It also was found that when participants' subjective reports of amount of homework completed did not match the objective data, the participants were typically over reporting the amount they did. Thus, they were saying that they did more than they actually brought to session. However, this tended to occur only among about 25% of the sample. This finding has clinical implications for treatment because patients may have completed the homework but forgot to bring it to session or misplaced it. If clients do not bring in the work they did, it is more difficult to review their understanding and cognitive flexibility and to identify further stuck points. Because about one quarter of the sample said that they did the homework but did not bring it to session, this finding demonstrates the importance of therapists reviewing the homework completed during each session or collecting it to get a more accurate understanding of the amount and quality of the work done.

Several limitations exist for the analyses regarding homework compliance. The actual amount of homework completed was obtained by chart review, including progress note examination and identification of homework that was collected by the therapist and

placed in the chart. Therefore, if a participant completed the homework but it was not collected by the therapist and there was no indication in the chart of how many worksheets were completed, this was rated as a 0. Therefore, therapist error could have impacted this variable. Moreover, the homework data was analyzed for the typical CPT protocol sessions, which excluded any homework turned in for sessions 13-18 (Variable grant participants). This was done because the CPT Homework Review Form was only designed and collected for the first 12 sessions, and sessions 13-18 were not standard, so it would be difficult to know what homework was assigned. However, this poses as a limitation because several participants exceeded the typical 12 sessions and thus may have benefitted from homework that was not recorded as part of this study.

Future studies are warranted given that research on homework compliance within PTSD treatments is still in its infancy. Current research questions about the amount of homework, time spent, and perceived helpfulness and the impact of these variables on treatment outcome should be replicated among a variety of samples and in relation to both PE and CPT treatments. This would assist in clarifying the current equivocal research findings and might allow for more generalizable findings across various populations and settings. It also might clarify how different ways of defining and measuring homework compliance impact the findings. Another of study that could benefit the field would be to analyze the quality of homework assignment completion. Although this may pose difficulties with creating a quantitative, objective classification system for rating the quality of the assignments, it would be interesting to assess whether higher quality of homework leads to increased changes in symptomatology. Additionally, studies assessing perceived helpfulness of homework over the course of treatment that

utilize a time-series analysis to further clarify the direction of the relationship between perceived helpfulness and symptom change would further our understanding of this phenomenon. This may further help to clarify the relationship between amount and helpfulness of homework and reduction in PTSD symptoms.

Attendance

Researchers have begun assessing the impact of attendance on treatment outcome. However, as with homework compliance, this topic is lacking extensive empirical investigation because few researchers have attempted to measure this process variable. When investigators have measured attendance, it is defined in a variety of different ways. Previous research has assessed attendance by measuring the number of sessions attended (Foa, 2005; Galovski, 2012; Howard, 1986), or the number of days between sessions (Reardon, 2002; Tarrier, 2000), but typically have not measured the number of sessions missed.

Theoretically, consistent attendance and regularity of sessions should relate to changes in PTSD and depression symptoms. In CPT, attendance is essential in order to activate the trauma memory and learn the skills necessary to challenge stuck points and create more adaptive beliefs. In PE, attendance is important to activate the fear memory while doing imaginal exposures, as well as to create the *in vivo* hierarchy. If these basic skills are not learned due to inconsistent attendance, it seems likely that clients would struggle with changing their beliefs or altering their fear network to be less easily activated. Attendance is also related to homework, because without attending sessions regularly, it seems possible that clients may never learn the necessary skills to complete

the homework, or may easily forget the skills, which can negatively impact homework compliance and quality.

The current study added to the literature base by replicating previous studies that have analyzed attendance irregularity (i.e., the average number of days between sessions; e.g., Reardon, 2002; Tarrier, 2000), but it also contributed to the literature by measuring attendance compliance in a new way. Previous studies have typically measured this variable by only assessing the number of sessions in relation to outcome. However, this study measured attendance compliance by taking into account the number of missed sessions as well. This score was calculated by dividing the number of sessions attended by the number of total sessions ever scheduled.

Surprisingly, the current study did not find significant correlations between attendance compliance and symptom change or between attendance irregularity and symptom change. This was inconsistent with the hypotheses that both of these variables would be significantly related to a change in symptoms through the course of treatment. The finding that session consistency did not relate to treatment outcomes may be due to the fact that clients often re-scheduled their missed appointments, so they were still able to obtain important skills when they attended at a later time. Moreover, one of the reasons that attendance regularity was not related to treatment outcome may be due to the fact that most of the clients attended sessions weekly, with an average of 8 or 9 days between sessions, depending upon completer status. The clients included in this sample were a part of research trials, in which they were encouraged to attend weekly and typically scheduled with a 1-week gap between sessions. Also, when they did not attend, they were contacted and encouraged to come back in a timely manner. Therefore, there was not a

large amount of variability on this variable. It would be beneficial for future studies to analyze this variable among community clinical samples that are not a part of a formal research trial, as these sample may evidence more variability in session regularity.

Moreover, it is easily assumed that session attendance is equivalent to engagement in treatment. However, this analysis looked at attendance as an isolated variable in relation to treatment outcome. It could be beneficial to assess this variable in conjunction with a number of other indicators of engagement. A recent article by Holdsworth, Bowen, Brown, and Howat (2014) discussed the complex construct of "client engagement." This article posited that client attendance is often perceived as a measure of treatment engagement; yet, treatment engagement consists of an intricate matrix of process variables, including effort within session (i.e., client participation) and homework compliance. Further, this article discussed important engagement factors such as client motivation as well as the therapeutic relationship. The current study does not take into account these variables, nor does it take into account additional variables that would seemingly impact treatment outcome, such as client satisfaction with the treatment, client understanding while in-session, or client cognitive flexibility. All of these variables would likely play a role in treatment outcome. Perhaps some of the clients within this sample had regular attendance, yet did not "buy into" the treatment, or did not experience the motivation or open-mindedness necessary for the change process to occur. On the other hand, clients may have been engaged but missed sessions due to life stressors (e.g., illness, childcare challenges, work responsibilities). Also, in the current study, many of the therapy tapes that were coded showed that some clients came to sessions, yet had difficulty comprehending some of the topics and skills taught in the

sessions. Therefore, it is not just coming to the session that is important, but truly understanding and integrating the skills into one's life that may matter more.

Among the exploratory analyses, the finding that treatment drop-outs had higher rates of attendance compliance than the completers is likely due to the fact that the drop-outs had fewer sessions, and thus had fewer opportunities to miss sessions. The completers attended more sessions, over a longer period of time, which likely explains why there were more cancelled and no-showed sessions within this group.

Several limitations exist for the current study's assessment of attendance variables. As mentioned previously, the study included clients who volunteered to participate as part of a research trial and were compensated after completing assessments (pre-treatment, post-treatment, follow-up). Therefore, findings related to attendance may not be generalizable to those attending therapy who are not participating in a research trial and thus have no opportunity for compensation. Similarly, the attendance compliance variable was measured in such a way as to be susceptible to therapist error. Therapists were expected to record the number of cancellations and no-shows, along with the dates, in the client's chart throughout treatment. However, if therapists were not diligent in recording this, this variable may not have been completely accurate.

Future studies should replicate these analyses because this topic is relatively new to the literature. However, in addition to analyzing how attendance compliance and attendance regularity are related to treatment outcome, it would be interesting to understand why clients miss their sessions. Understanding if clients miss their sessions due to daily stressors, lack of buy-in to treatment, or avoidance inherent in PTSD, would

be beneficial for tailoring treatment to try to address these concerns, since these may affect treatment outcome.

Conclusions

In summary, avoidance plays a significant role in the lives of people suffering from PTSD. As a result, clients may engage in a number of strategies in attempts to avoid the trauma. Some of those strategies are reflected in the PTSD symptoms themselves (e.g., avoidance of thoughts, feelings, conversations). The PTSD literature has given attention to reductions in avoidance symptoms outside of the therapy setting, but less is understood about avoidance strategies that occur in relation to the therapy protocol. Yet, the extent to which clients avoid the trauma memory during treatment likely influences the outcome of treatment. The current study was a first step in furthering the field's understanding of important avoidance factors during the course of CPT (e.g., lack of in-session engagement, homework non-compliance, and inconsistent treatment attendance). Although these factors were found to have minimal influence on symptom changes, further inquiry into these concepts is essential. Because of the importance of client engagement in the treatment process and the role of avoidance in maintaining PTSD, delving into the role of client avoidance process variables seems invaluable to investigate. By furthering our understanding of these concepts, we can work to advance current treatments for trauma survivors suffering with PTSD.

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Table 1

Useable CPT Session Tapes (N=70)

| | | CPT Sessions | | | | | | | | | | | | Total Tapes |
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
Variable	Completer Tapes	19	20	21	21	19	18	13	13	11	11	8	7	181
	Drop-out Tapes	7	6	2	2	2	2	1	1	1	1	0	0	25
Hypnosis	Completer Tapes	26	24	25	23	25	25	24	26	24	26	26	25	299
	Drop-out Tapes	14	11	7	6	5	2	0	0	0	0	0	0	45
Total Completer Tapes (Variable + Hypnosis)		45	44	46	44	44	43	37	39	35	37	34	32	480
Total Drop-Out Tapes (Variable + Hypnosis)		21	17	9	8	7	4	1	1	1	1	0	0	70
Overall Total Tapes		66	61	55	52	51	47	38	40	36	38	34	32	**550**

Table 2

Change Scores for Outcome Variables

Measure	*n*	*Mean*	*SD*	Minimum	Maximum
CAPS Pre	69	75.64	17.91	29.00	105.00
CAPS Final	50	28.80	26.69	0.00	108.00
CAPS Change	49	44.86	25.06	-14.00	89.00
PDS Pre	68	32.69	8.58	12.00	48.00
PDS Final	70	15.91	14.64	0.00	51.00
PDS Change	68	16.87	13.15	-10.00	43.00
BDI-II Pre	70	29.54	10.97	0.00	54.00
BDI-II Final	69	15.65	15.93	0.00	59.00
BDI-II Change	69	13.70	14.94	-17.00	45.00

Note. Negative minimum scores are possible because some clients, although few, demonstrated an increase in their symptoms from pre-treatment to post-treatment.

Table 3

Descriptive Statistics of Session Coding Variables (Graduate Student Ratings)

Measure	*n*	*Mean*	*SD*	Minimum	Maximum
Avoidance of memory	67	.84	1.07	0.00	5.00
Avoidance of engagement w/ therapist	70	.61	1.00	0.00	4.00
Avg sadness mode	69	1.28	.46	1.00	3.00
Avg sadness peak	69	2.08	1.31	1.00	6.00
Avg anger mode	69	1.03	.09	1.00	1.50
Avg anger peak	69	1.16	.35	1.00	2.83
Avg fear mode	69	1.06	.16	1.00	2.00
Avg fear peak	69	1.20	.43	1.00	3.18
Avg numbing	69	2.66	6.01	0.00	35.00

Table 4

Intra-Class Correlation Coefficients for Coders' Ratings of Client Variables Based on

Reviews of Session Video Tapes

Variables	Graduate Students' Ratings	Graduate Student/ Expert Rater Ratings
All variables (engagement, sad, anger, fear, "other," numb, includes mode, peak, % of session estimate variables)	.35	.33
All variables without % estimate	.63	.72
Duration of session variables	.33	.66
Client engagement (memory & therapist)	.36	.66
All emotion variables (sad, anger, fear) (mode & peak ratings)	.77	.83
Sad (% of session)	.15	.83
Sad (mode)	.55	.79
Sad (peak)	.73	.83
Anger (% of session)	.89	.26
Anger (mode)	N/A*	N/A*
Anger (peak)	.74	.61
Fear (% of session)	.35	.08
Fear (mode)	N/A*	N/A*
Fear (peak)	.37	.41
Numb (% of session)	.35	-.03

*N/A= No correlation could be calculated for these variables due to the lack of variance in ratings. Specifically, one rater rated all of anger mode and fear mode ratings with the same score, so there was no within-rater variance in which to calculate the ICC.

Table 5

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Avoidance Variables among Completers (n= 45)

Variable	1	2	3	4	5
Trauma memory avoidance	---	.56** (.89**)	-.27* (-.75*)	-.06 (-.75*)	-.11 (-.61)
Avoidance of engagement with therapist	.56** (.89**)	---	-.14 (-.76*)	-.21 (-.89**)	-.16 (-.70)
CAPS Change	-.27* (-.75*)	-.14 (-.76*)	---	.70** (.55)	.71** (.43)
PDS Change	-.06 (-.75*)	-.21 (-.89**)	.70** (.55)	---	.75** (.81*)
BDI-II Change	-.11 (-.61)	-.16 (-.70)	.71** (.43)	.75** (.81*)	---

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

Note. The correlations on the top are derived from the composite graduate student ratings. The correlations below in parentheses represent the expert rater data.

Table 6

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Display of Sadness among Completers (n=44)

Variable	1	2	3	4	5
Average sad Mode	---	.86** (.94**)	-.03 (.52)	.03 (.31)	.04 (.70)
Average sad Peak	.86** (.94**)	---	.01 (.37)	.10 (.35)	.14 (.71)
CAPS Change	-.03 (.52)	.01 (.37)	---	.70** (.55)	.71** (.43)
PDS Change	.03 (.31)	.10 (.35)	.70 (.55)	---	.75** (.81*)
BDI-II Change	.04 (.70)	.14 (.71)	.71 (.43)	.75** (.81*)	---

$* p < .05. \quad ** p < .01.$
Note. The correlations on the top are derived from the composite graduate student ratings.
The correlations below in parentheses represent the expert rater data.

Table 7

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Anger Variables among Completers (n=44)

Variable	1	2	3	4	5
Average anger mode	---	.64**	-.10	-.13	-.18
Average anger peak	.64**	---	.02 (-.35)	.07 (-.75*)	-.06 (-.99*)
CAPS Change	-.10	.02 (-.35)	---	.70** (.55)	.71** (.43)
PDS Change	-.13	.07 (-.75*)	.70** (.55)	---	.75* (.81*)
BDI-II Change	-.18	-.06 (-.99*)	.71** (.43)	.75** (.81*)	---

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

Note. No expert rater anger mode scores were obtainable because there was no variance for this item. Specifically, the rater gave these participants the same score, so no correlation could be calculated.

Table 8

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Fear Variables among Completers (n=44)

Variable	1	2	3	4	5
Average fear mode	---	.65**	-.32*	-.23	-.31*
	N/A**	N/A**	N/A**	N/A**	N/A**
Average fear peak	.65**	---	-.18	-.20	-.15
	N/A**		(-.10)	(.43)	(.78*)
CAPS Change	-.32	-.18	---	.70**	.71**
	N/A**	(-.10)		(.55)	(.43)
PDS Change	-.23	-.20	.70**	---	.75*
	N/A**	(.43)	(.55)		(.81*)
BDI-II Change	-.31	-.15	.71**	.75**	---
	N/A**	(.78)	(.43)	(.81*)	

* p < .05. ** p < .01.
Note. No expert rater fear mode scores were obtainable because there was no variance for this item. Specifically, the rater gave these participants the same score, so no correlation could be calculated.

Note. The correlations on the top are derived from the composite graduate student ratings. The correlations below in parentheses represent the expert rater data.

Table 9

Correlations of In-Session Numbing among Completers (n=44)

Variable	1	2	3	4
Average numbing	---	.19 (.23)	.17 (-.73)	.01 (-.64)
CAPS Change	.19 (.23)	---	.62** (.43)	.71** (.43)
PDS Change	.17 (-.73)	.62** (.43)	---	.72** (.83)
BDI-II Change	.01 (-.64)	.71** (.43)	.72** (.83)	---

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

Note. The correlations on the top are derived from the composite graduate student ratings. The correlations below in parentheses represent the expert rater data.

Table 10

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Avoidance Variables among Drop-Outs (n=19)

Variable	1	2	3	4
Trauma memory avoidance	---	.23	-.36	-.01
Avoidance of engagement with therapist	.23	---	-.53**	-.22
PDS Change	-.36	-.53**	---	.71**
BDI-II Change	-.01	-.22	.71**	---

*p < .05. ** p < .01.
Note. No expert rater data was available for drop-outs.

Table 11

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Sadness Variables among Drop-Outs (n=22)

Variable	1	2	3	4
Average sad mode	---	.66**	-.22	-.25
Average sad peak	.66**	---	-.23	-.24
PDS Change	-.22	-.23	---	.71
BDI-II Change	-.25	-.24	.71	---

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

Note. No expert rater data was available for drop-outs.

Table 12

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Anger Variables among Drop-Outs (n=22)

Variable	1	2	3	4
Average anger mode	---	.41**	-.32	---
Average anger peak	.41**	---	-.25	-.26
PDS Change	-.32	-.25	---	.71**
BDI-II Change	N/A**	-.26	.71**	N/A**

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

Note. BDI-II scores were not calculated because there was no variance among the anger mode variable for participants that had BDI-II data.

Note. No expert rater data was available for drop-outs.

Table 13

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Fear Variables among Drop-Outs (n=22)

Variable	1	2	3	4
Average fear mode	---	.72**	-.45*	-.20
Average fear peak	.72**	---	-.23	.03
PDS Change	-.45*	-.23	---	.71**
BDI-II Change	-.20	.03	.71**	---

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

Note. No expert rater data was available for drop-outs.

Table 14

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for In-Session

Numbing among Drop-Outs (n= 22)

Variable	1	2	3
Average numbing	---	.01	.02
PDS Change	.01	---	.73**
BDI-II Change	.02	.73**	---

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

Note. No expert rater data was available for drop-outs.

Table 15

Descriptive Statistics for Homework Variables

Measure	*n*	*Mean*	*SD*	Minimum	Maximum
Avg hw amt returned	63	.55	.30	0.00	1.58
Avg subj hw	64	2.53	.70	1.00	5.00
Avg helpful	57	3.23	.73	1.00	4.64
Avg minutes	60	73.54	63.68	10.00	271.43

Table 16

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for Homework

Variables among Completers (n=44)

Variable	1	2	3	4	5	6	7
Avg hw amt returned	---	.47**	-.00	.34*	.17	.07	.13
Avg Subj amt hw	.47**	---	-.08	.34*	-.04	-.01	.12
Avg hw helpfulness	-.00	-.08	---	.15	.36**	.34*	.17
Avg hw minutes	.34*	.34*	.15	---	-.07	.01	.00
CAPS change	.17	-.04	.36**	-.07	---	.70**	.71**
PDS change	.07	-.01	.34*	.01	.70**	---	.75**
BDI-II change	.13	.12	.17	.00	.71**	.75**	---

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

Table 17

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for Homework

Variables among Drop-Outs (n=9)

Variable	1	2	3	4	5	6
Avg hw amt returned	---	.25	-.18	.15	-.04	-.04
Avg subj hw amt	.25	---	.53	.44	-.12	-.17
Avg hw helpfulness	-.18	.53	---	.26	.30	.04
Avg hw minutes	.15	.44	.26	---	-.43	-.81**
PDS change	-.04	-.12	.30	-.43	---	.71**
BDI-II change	-.04	-.17	.04	-.81**	.71**	---

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

Table 18

Percent of Matching, Over Reports, and Under Reports of Homework Worksheets

(N=70)

Assignment	Match	Overreport	Underreport
ABC Sheets (session 3)	66.00%	20.00%	14.00%
ABC Sheets (session 4)	77.36%	13.21%	9.43%
ABC Sheets (session 5)	75.47%	15.09%	9.43%
Challenging Questions (session 6)	68.89%	20.00%	11.11%
Patterns of Problematic Thinking (session 7)	68.42%	26.32%	5.26%
CBWs (session 8)	52.94%	44.11%	2.94%
CBWs (session 9)	52.78%	44.44%	2.78%
CBWs (session 10)	79.41%	17.65%	2.94%
CBWs (session 11)	76.67%	20.00%	3.33%
CBWs (session 12)	75.00%	21.43%	3.57%

Table 19

Number of Times Clients Reported Thinking about or Working on Impact Statements and

Trauma Accounts

Assignment	*n*	*Mean*	*SD*	Minimum	Minimum
Impact Statement (session 2)	64	3.06	1.27	1.00	5.00
Impact Statement (session 12)	24	2.29	1.00	1.00	4.00
Trauma Account (session 4)	55	2.85	1.04	1.00	5.00
Trauma Account (session 5)	53	2.91	1.16	1.00	5.00

Table 20

Percentage of Assigned Homework Completed and Attempted

Assignment	*Mean Percentage of Assigned Homework Completed*	*SD*	*n*	% of clients who attempted assignment (1 or more worksheets)
Impact Statement (session 2)*	---	---	63	82.54%
ABC Sheets (session 3)	.84	.72	53	83.02%
ABC Sheets (session 4)	.51	.51	54	66.67%
ABC Sheets (session 5)	.36	.54	54	55.56%
Trauma Account (session 4)*	---	---	54	85.19%
Trauma Account (session 5)*	---	---	53	88.68%
Challenging Questions (session 6)	.46	.51	45	80.00%
Patterns of Problematic Thinking (session 7)	.26	.28	40	70.00%
CBWs (session 8)	.33	.35	36	69.44%
CBWs (session 9)	.40	.42	36	66.67%
CBWs (session 10)	.30	.30	34	64.71%
CBWs (session 11)	.36	.29	31	77.42%
CBWs (session 12)	.24	.30	29	55.17%
Impact Statement (session 12)*	---	---	46	71.74%

* Only one assignment given, so no mean percentage calculated.

Table 21

Perceived Helpfulness of Each Assignment

Assignment	*n*	*M*	*SD*	Minimum	Maximum
Impact Statement (session 2)	42	3.00	1.19	1.00	5.00
ABC Sheets (session 3)	46	3.00	.94	1.00	5.00
ABC Sheets (session 4)	33	3.42	1.17	1.00	5.00
ABC Sheets (session 5)	26	3.46	.90	2.00	5.00
Trauma Account (session 4)	41	2.76	1.36	1.00	5.00
Trauma Account (session 5)	40	3.40	1.01	1.00	5.00
Challenging Questions (session 6)	35	3.49	.89	1.00	5.00
Patterns of Problematic Thinking (session 7)	28	3.04	1.10	1.00	5.00
CBWs (session 8)	29	3.38	.90	2.00	5.00
CBWs (session 9)	26	3.73	.72	2.00	5.00
CBWs (session 10)	24	3.42	.97	2.00	5.00
CBWs (session 11)	27	3.44	1.09	1.00	5.00
CBWs (session 12)	16	3.88	.72	3.00	5.00
Impact Statement (session 12)	17	3.76	.83	2.00	5.00

Table 22

Descriptive Statistics for Attendance Variables

Measure	*n*	*Mean*	*SD*	Minimum	Maximum
Attendance compliance	70	.80	.19	.32	1.00
Attendance irregularity	63	8.64	3.58	3.00	18.00

Table 23

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for Attendance

Variables among Completers (n=45)

Variable	1	2	3	4	5
Attendance Compliance	---	-.54**	.05	-.10	-.09
Attendance Irregularity	-.54**	---	-.23	-.12	-.03
CAPS Change	.05	-.23	---	.70**	.71**
PDS Change	-.10	-.12	.70**	---	.75**
BDI-II Change	-.09	-.03	.71**	.75**	---

$* p < .05. \quad ** p < .01.$

Table 24

Correlation Coefficients (Based on One-Tailed Spearman's Rho Tests) for Attendance

Variables among Drop-Outs (n=15)

Variable	1	2	3	4
Attendance Compliance	---	-.48**	-.27	-.25
Attendance Irregularity	-.48**	---	-.10	.08
PDS Change	-.27	-.10	---	.71**
BDI-II Change	-.25	.08	.71**	---

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

Table 25

Final Sessions that Clients Completed (Number and Percentage of Entire Sample)
(N=70)

Total Number of Sessions	*n*	%
1	6	9
2	8	11
3	1	1
4	1	1
5	6	9
6	6	9
7	2	3
8	1	1
9	1	1
10	4	6
11	1	1
12	26	37
13	2	3
14	0	0
15	1	1
16	0	0
17	0	0
18	4	6

Table 26

Percent of Clients who Missed Each CPT Session (N=70)

Session Number	*n (missed)*	% of clients who missed session	*n (total clients who attended that session)*
1	13	19	70
2	18	28	64
3	17	30	56
4	10	18	55
5	16	30	54
6	15	31	48
7	15	36	42
8	10	25	40
9	12	31	39
10	8	25	38
11	9	26	34
12	4	12	33
13	2	29	7
14	0	0	7
15	0	0	5
16	2	40	5
17	3	60	5
18	0	0	4

Note. This table includes the number of clients who missed the appointment but later re-scheduled and attended (missed column), as well as the total number of participants who eventually completed the session (total clients column).

Appendix A

Client Behaviors Section

Note: Some of the scales in the client section are modified from the therapist section!
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1. _____ Is client <u>avoiding</u> engagement with the therapist?

Examples (high score): client appeared to lack participation via having minimal
responses, repeatedly saying "I don't know," having nonverbal gestures of disinterest
(e.g., checking phone, looking repeatedly at the clock, etc.)
Examples (0/low score)-answered questions, interacted regularly with the therapist,
    appeared to put effort & interest into the session

0	1	2	3	4	5	6	7

Not   Barely   Very Minimal   Minimal   Moderate   Strongly   Very   Completely
at all

2. _____ Is client <u>avoiding</u> engagement with the trauma memory?

Examples (high score): client appeared to effortfully avoid the memory (e.g., changed
the topic away from the trauma)
Examples (0/low score): client appeared open to discuss/engage with trauma memory
(e.g., remained trauma-focused)

0	1	2	3	4	5	6	7

None   Barely   Very Minimal   Minimal   Moderate   Much   A lot   Extreme

3. _____ Client appears to understand concept of stuck point.

Examples (high score): client able to generate own stuck point, discuss
concept/definition of stuck point
Examples (0/low score): client unable to identify examples of his/her own stuck
points, unable to explain/define stuck point
*Note: Insert N/A if no opportunity for client to demonstrate understanding.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Not at all   Poorly   Barely   Mediocre   Somewhat   Mostly   Quite well   Completely

4. _____ **Client returned to session bringing ATTEMPTED practice assignment due at this session (Session 12: impact statement).**

*Note: "attempted" means the client at least began/did some of the assignment (does not have to be complete)
Write Y (if brought assignment) or N (if did not bring assignment) in the blank above and if no, check the box with appropriate explanation.
*Note: If client reports that they did the homework, or attempted it, but did not bring it to session, place N in the blank and check appropriate box.

Lack of understanding/ too difficult	Avoidance/ PTSD	Not seen as worthwhile/helpful/ refusal	Not enough time	Forget/ Left at home	None mentioned	Other reason (please write in box below)

5. _____ **Client returned to session bringing ATTEMPTED practice assignment due at this session (Session 12: challenging beliefs worksheets).**

*Note: "attempted" means the client at least began/did some of the assignment (does not have to be complete)
Write Y (if brought assignment) or N (if did not bring assignment) in the blank above and if no, check the box with appropriate explanation.
*Note: If client reports that they did the homework, or attempted it, but did not bring it to session, place N in the blank and check appropriate box.

Lack of understanding/ too difficult	Avoidance/ PTSD	Not seen as worthwhile/helpful/ refusal	Not enough time	Forget/ Left at home	None mentioned	Other reason (please write in box below)

6. _____ Client returned to session bringing ATTEMPTED <u>re-assigned practice assignment</u>.
Insert name of assignment _____.
 *Note: This will only be applicable if therapist re-assigned homework from previous session to be completed in this session (e.g., if they did not complete impact statement from previous session, and therapist asked client to bring it to this session).
 *Note: "attempted" means the client at least began/did some of the assignment (does not have to be complete)
 Write Y (if brought assignment) or N (if did not bring assignment) in the blank above and if no, check the box with appropriate explanation.
*Note: If client reports that they did the homework, or attempted it, but did not bring it to session, place N in the blank and check appropriate box.
*Note: If more than 1 task are re-assigned, if the client brings both, mark Y, if he/she brings none, mark N, if they bring 1, but not both, mark P (partial). If Y or P, check appropriate box below.

Lack of understanding/ too difficult	Avoidance/ PTSD	Not seen as worthwhile/helpful/ refusal	Not enough time	Forget/ Left at home	None mentioned	Other reason (please write in box below)

7. **Estimation of the # of total number of worksheets client brought to session (if possible):** _____

    *Note: If no way to tell, please insert 666 (missing)

8. _____ **Rate the level of client cognitive flexibility in the space using the scale below.**

    Examples (high score): client is able to integrate new information to alter existing stuck point, can come up with alternative, more flexible beliefs
    Examples (0/low score): client continues to believe stuck point and does not appear to take into account new information or evidence (e.g., they hold tightly to their stuck point)

    0   1   2   3   4   5   6   7
    _____

    Completely Rigid   Poor Mediocre Somewhat Mostly Very   Open Mind
    Resistant

9. **Rate how much client expresses <u>all</u> the following emotions based on Client Emotional Arousal Scale-III ratings (1-7).**

    Modal rating= overall/average amount of that emotion for the session
    Peak rating= most extreme amount of that emotion the client exhibits in session
    Estimated % of session= approximate % of session the client exhibited that emotion
    Example: If client cries throughout the entire session, sadness would be 100% duration
    *Note: Please only rate the amount of emotion the client <u>exhibits</u>, not what he/she verbally reports.
    *Note- If any other emotions that are not listed are expressed, please list/rate them in Other column(s).

	Sadness (crying, shaky voice, long pause)	Anger (yelling, loud tone of voice, physical movements)	Anxiety/Fear (hunch over, crying, shaking)	Other _____ (insert name of emotion)	Other _____ (insert name of emotion)	Did client appear numb (expresses no emotions)?
Modal rating						Y or N
Peak rating						
Estimated % of session						_____ % of session

Additional Considerations
----

10. Please give a rating of the therapist's overall CPT skills as demonstrated throughout the course of CPT.

1	2	3	4	5	6	7

Poor   Barely   Mediocre   Satisfactory   Good   Very Good

Excellent   Adequate

11. Please give a rating of the therapist's overall ability to rely on Socratic dialogue throughout the course of CPT.

1	2	3	4	5	6	7

Poor   Barely   Mediocre   Satisfactory   Good   Very Good   Excellent

      Adequate

12. Please give a rating of the therapist's overall ability to prioritize assimilation over over-accommodation throughout the course of CPT.

1	2	3	4	5	6	7

Poor   Barely   Mediocre   Satisfactory   Good   Very Good   Excellent

      Adequate

13. Please give a rating of the therapist's overall ability to effectively utilize and navigate homework throughout the course of CPT.

1	2	3	4	5	6	7

Poor   Barely   Mediocre   Satisfactory   Good   Very Good   Excellent

      Adequate

14. Please give a rating of the therapist's overall ability to appropriately encourage and emphasize the expression of natural affect throughout the course of CPT.

1	2	3	4	5	6	7
Poor	Barely Adequate	Mediocre	Satisfactory	Good	Very Good	Excellent

15. Please give a rating of the client's avoidance of engagement with the therapist throughout the course of CPT.

0	1	2	3	4	5	6	7
Not at all	Barely	Very Minimal	Minimal	Moderate	Strongly	Very	Completely

16. Please give a rating of the client's avoidance of engagement with the trauma memory throughout the course of CPT.

0	1	2	3	4	5	6	7
None	Barely	Very Minimal	Minimal	Moderate	Much	A lot	Extreme

17. Please give a rating of the client's overall ability to demonstrate understanding of a stuck point throughout the course of CPT.

0	1	2	3	4	5	6	7
Not at all	Poorly	Barely	Mediocre	Somewhat	Mostly	Quite well	Completely

18. Please give a rating of the client's overall compliance with attempting homework assignments throughout the course of CPT.

1	2	3	4	5	6	7
Poor	Barely Adequate	Mediocre	Satisfactory	Good	Very Good	Excellent

19. Please give a rating of the client's overall demonstration of cognitive flexibility throughout the course of CPT.

0	1	2	3	4	5	6	7

Completely Rigid   Poor Mediocre   Somewhat   Mostly   Very   Open Mind
Resistant

20. Please write down any additional comments that you may have regarding the ratings on this tape including any departures from the protocol and the adequacy with which the therapist dealt with the problems that led to the departure.