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CONSISTENCY OF WRITTEN TRAUMA NARRATIVES OVER A COURSE OF
TRAUMA-FOCUSED THERAPY

by

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Abstract

Several of the procedures commonly used in trauma-focused therapies are similar to techniques that have been shown to influence the consistency and accuracy of memory in experimental settings. These techniques include verbalizing a non-verbal memory, repeatedly recalling an event, and recalling an event in the presence of another person. In an effort to examine the impact of these techniques on memory for a traumatic event, and in turn the impact of traumatic memory change on treatment outcome, the present study examined changes in the written trauma narratives created over the course of trauma-focused therapy. Participants were PTSD positive female survivors of interpersonal assault (N = 41). Specific hypotheses predicted that participants who produced five written narratives would demonstrate greater increases in trauma-specific detail, more inconsistencies with respect to trauma details, and greater decreases in psychogenic amnesia than those participants who produced two written narratives. Results did not support these hypotheses and instead indicated that narrative length, amount of trauma-specific detail, and self-assessed ability to remember important aspects of the trauma did not change significantly from first to final narrative for either narrative condition. Although few factual inconsistencies were detected, qualitative analysis of the narratives revealed that many participants included important trauma-related details in the first account but not the final, or vice versa. Within the 5-narrative condition, narrative change was found to be predictive of PTSD symptom severity such that those participants who added more trauma details in the final narrative had more severe PTSD at post-treatment. Clinical and legal implications are discussed.

Consistency of Written Trauma Narratives Over a Course of Trauma-Focused Therapy

A trauma is defined as an event in which an individual experiences or witnesses threat to the self or others, resulting in feelings of intense fear, helplessness, or horror (American Psychiatric Association, 2000). The way in which an individual processes the memory for this event has been theorized to be fundamental to the development and maintenance of Posttraumatic Stress Disorder (PTSD; Siegel, 1995; Harvey & Bryant, 1999), a disorder characterized by symptoms of avoidance, hyperarousal, and repeated re-experiencing of the traumatic event. The degree of disorganization of the traumatic memory may predict PTSD development (Gray & Lombardo, 2001; Halligan et al., 2003; Murray, Ehlers, & Mayou, 2002), and greater PTSD symptom severity appears to be related to inconsistencies in traumatic memory (Van Geizen et al., 2005).

Traumatic memory also plays an important role in the treatment of PTSD, particularly with the exposure components included in empirically supported trauma interventions such as Cognitive Processing Therapy (CPT) and Prolonged Exposure (PE) which dedicate substantial time to the repetitive review of the traumatic memory. In these trauma-focused therapies, the clinician typically accepts a client's self-reported memories of previous experiences as generally accurate. Good clinical care would be impeded if the therapist needed to question, verify, and confirm every aspect of a client's self reported memories, and most professional guidelines regarding traumatic memory advise therapists to refrain from evaluating the veracity of a client's memory (Health Council of the Netherlands, 2004). Assumptions of accuracy thus pervade, but little empirical or clinical attention has been given to potentially important changes in traumatic memory over the course of therapeutic treatment. This is particularly surprising

given the substantial body of research that has clearly established the limitations of autobiographical memory, and traumatic memory in particular (for a review see McNally, 2003).

Traumatic Memories: Encoding, Storage, and Recall

Few autobiographical memories are exact reproductions of the actual occurrence of any given event (McNally, 2003). Rather, these memories are subjected to a reconstructive process that can be influenced by the individual's perspective and emotional arousal at the time of *encoding*. Encoding is the first of the three core processes of memory, preceding *storage* and *retrieval*, and involves the processing of sensory information into memory, either through automatic processing or conscious and effortful processing (Atkinson & Shiffrin, 1968). Traumatic memories are typically encoded when the individual is in a hyperaroused state, referred to as the "fight-or-flight" response. A number of physiological changes accompany this fear reaction, including elevated heart rate and blood flow away from the brain towards major muscle groups, often creating sensations of dizziness or lightheadedness. This physiological state and its associated emotions have been paradoxically linked with both increases and decreases in the clarity and accuracy of traumatic memory. On the one hand, some researchers suggest that a trauma victim's intense emotions and extreme physiological response create a disadvantaged state for encoding memory (Christianson & Loftus, 1990; Halligan, Michael, Clark, & Ehlers, 2003), whereas others note that traumatic memories can often be intensely vivid and enduring (e.g., McGaugh, 2003; Peace, Porter, & ten Brinke, 2008). Although physiological and psychological arousal may increase memory clarity for some aspects of the trauma, this arousal appears to render other aspects of the

memory prone to error (Wessel & Merckelbach, 1994; Christianson, 1992; Van der Kolk & Fissler, 1995; Payne et al., 2006). Based on these equivocal findings, it appears that a conceptualization of extreme stress as singularly enhancing or detrimental to memory would be an overgeneralization, and would overlook the intricacies of the relationship between extreme stress and memory encoding.

Once encoded, traumatic memories tend to be *stored* and *retrieved* differently than neutral memories. Traumatic memories tend to be stored as fragments, have little attached narrative, and are often dissociated from consciousness (Macintosh & Whiffen, 2005). Neuroimaging studies have provided evidence for the unique nature of traumatic memories, indicating that the recall of traumatic memories inspires activation patterns in the brain different than those inspired by everyday memories (Bremner, 2001). Specifically, neuropsychological evidence suggests decreases in hippocampal activity and increases in amygdala activity when recalling events of extreme stress (Jacobs & Nadel, 1998). Difficulty with traumatic memory retrieval has been linked with reduced perfusion (i.e., nutritive delivery of blood) in the right temporal and frontal areas of the brain, both of which are critical for episodic memory retrieval (Markowitsch et al., 1997).

Trauma survivors commonly experience difficulty with memory *retrieval*, defined as the process of accessing stored memories, reporting that some important parts of the memory are missing or inaccessible. When an individual experiences memory loss for important aspects of a traumatic event, this is referred to as *psychogenic amnesia*. Psychogenic amnesia is considered to be a symptom of PTSD, and is defined in the DSM-IV (APA, 1994), as an “inability to remember important parts of the event.” Although trauma induced dissociation can interfere with the ability to correctly encode a

memory of the traumatic event, psychogenic amnesia is typically conceptualized as the result of dysfunctions in storage and retrieval, rather than an encoding error (Kopelman, 2002). That is, victims can experience psychogenic amnesia for a traumatic experience that was fully encoded, but is not consciously available. Psychogenic amnesia for a traumatic event should also be distinguished from non-disclosure of the trauma, or conscious avoidance of thoughts related to the trauma, neither of which reflect an inability to recall the event, but rather, an unwillingness to revisit the horror of the experience (McNally, 2004). Clinically, many trauma victims report experiencing amnesia for an important aspect of the event that they could once recall, or feel that they could recall more of the trauma if they were to try harder to access that portion of the memory. This 'feeling of knowing' phenomenon provides support for the supposition of intact encoding. Moreover, additional details of an emotionally arousing event are often remembered at a later stage (Van Geizen et al., 2005), providing further evidence that the presence of psychogenic amnesia does not indicate a problem with encoding.

In summary, although some trauma victims may remember certain aspects of the event with exceptional clarity, traumatic memories are by no means impervious to distortion. Although traumatic memories appear distinctive in terms of storage and recall, they appear to be as malleable as non-traumatic memories and equally, if not more so, susceptible to contamination and forgetting (Nourkova, Berstein, & Loftus, 2004). Prior claims by some (e.g., Goodman, 1991) that traumatic memories are by nature impervious to distortion have been challenged by empirical data. It is now generally accepted that traumatic memories are not immune to forgetting and distortion, and are, contrarily,

susceptible to errors and alterations during encoding, as well as the later stages of storage, and retrieval (Howe, 2000).

Cognitive Research

Trauma survivors who choose to participate in treatments that contain exposure-based components may be particularly vulnerable to changes in memory over time given that the therapeutic procedures and techniques used in these treatments demonstrate significant overlap with techniques that have been shown to influence memory in a laboratory context. These techniques include (1) repeated recall, (2) verbalization of a non-verbal memory, and (3) recall in the presence of another person. To better understand the mechanisms through which exposure-based psychotherapeutic interventions exert influence on memory, a brief review of cognitive and experimental research on memory for these specific techniques is necessary. Although the influence of these techniques has not yet been tested in a clinical setting, we are able to draw upon and extrapolate from a wealth of cognitive psychology research conducted primarily in experimental settings.

Repeated Recall. It has long been recognized that repeated attempts at probing, searching, and activating memory traces can influence the accuracy of future recall (Bjork, 1975). Repeatedly recalling a memory has demonstrated paradoxical effects in that it can be both protective and detrimental to the accuracy and consistency of the memory. In one sense, repeatedly recalling information may consolidate and strengthen the memory trace by connecting it with a greater number of retrieval cues, thereby increasing the likelihood of later recall. Consistent with this theory, experimental testing with forced word recall (rather than free recall) shows that repeated attempts to remember

led to increased performance (Wheeler & Roedeger, 1992). However, repeated recall with word lists has also demonstrated deleterious effects on memory in that it can increase recall of inaccurate information, and may potentially lead to false memories (Roediger, Jacoby, McDermott, 1996). In a review of the research on effects of repeated recall attempts, Roediger, McDermott, and Goff (1997) concluded that multiple recall attempts are both enhancing and detrimental to memory.

This dual effect had been previously observed in a study designed to investigate recall for events viewed during a slideshow (Eugenio, Buckhout, Kostas, & Ellison, 1982). Participants showed modest increases in the amount of correct information recalled over the course of multiple recall attempts; however, these improvements were accompanied by significant increases in memory intrusions, indicating that individuals may construct information when forced to repeatedly remember an event. This finding has been consistently replicated in more recent studies. Henkel (2004) observed that although the number of correct items recalled from a list increased with the amount of recall repetition, so did the number of source errors. Similarly, McDermott (2006) replicated this finding by administering short word lists of semantic associates (e.g., ice, freeze, snow) that were thematically related to a non-presented word (e.g., cold). Recall of both presented words and non-presented words increased over the course of three subsequent recall attempts, and many subjects endorsed that they had a “vivid recollection” of encoding the non-presented word. Just as memory for the process of retrieval may bolster correct information, retrieval may similarly bolster ‘memory’ for incorrect information, thereby increasing the probability that this incorrect information will be recalled during subsequent recall attempts (Odinot & Wolters, 2006). Repeated

recall can also negatively affect memory by increasing the risk of source monitoring errors. Goernet (2005) tested participants' abilities to remember words from two separate lists and observed that source monitoring ability decreased with repeated trials. With respect to metamemory, repetition served to increase the confidence with which one remembers both true and false aspects of the memory. That is, participants became more confident in their responses with more recall attempts, irrespective of the correctness of the response.

Although the majority of studies examining the effects of repeated recall have done so using word lists in laboratory setting, a smaller body of research examining the effects of repeated recall on autobiographical memories indicates similar paradoxical effects. Findings observed with episodic memories, or autobiographical memories for events, suggest that repeated remembering can make false memories richer in recollective experience and more like true memories (Heaps & Nash, 2001). Researchers have observed that portions of an autobiographical memory that were previously unremembered are often reported as remembered after repeated retelling (Bartlett, 1932; Conway, 1992; Neisser & Fivush, 1994). Thus, the experience of recalling and retelling autobiographical memories may render these memories susceptible to reconstructive effects. It should be noted that the accuracy of these re-remembered aspects of memory has not always been examined, particularly when the memory concerns a naturalistically occurring event. In contrived settings, however, researchers have observed an increase in the number of accurate details of a traumatic memory recalled with repeated questioning or testing, without accompanying increases in errors. Scrivner and Safer (1988) repeatedly tested participants after they witnessed a simulated robbery and observed that

participants became more accurate in their free recall of trauma details with each of the four tests. Although this study faced several limitations, most notably that the trauma was a video of a simulated event and all recall attempts occurred within a 48-hour period, these results indicate that repeated recall does not leave memory unaffected. These findings speak to the need for future research on traumatic memory in a less contrived and more naturalistic setting.

Verbalization of the trace. “The structure of discourse affects the structure of recall, which in turn affects the structure of later recall” (Rubin, 1996, p. 118); In short, the language of recall shapes memory. In trauma therapy, clients are frequently asked to talk or write about the details of their traumatic experience. The rationale behind this treatment technique involves the activation of emotions (e.g., fear) linked to the trauma thereby triggering a heightening in physiological reactivity. When the client continues to engage in exposure to the traumatic material until experiencing a decrease in emotional intensity, this experience refutes the expectation that these emotions will continue to increase indefinitely once activated, and will thereby decrease the client’s emotional reaction to the stimuli. This process, typically regarded as an opportunity for the client to habituate to strong emotions related to the trauma, may in fact serve to influence the client’s traumatic memory. Verbalizing a memory trace, either orally or in writing, may help to solidify both accurate and inaccurate aspects of the memory. Furthermore, when instructed to make an initial retrieval attempt, individuals tend to make guesses about information that may not clearly be remembered, and on subsequent retrievals, they accept their earlier guesses as factual and accurate (Roediger, Wheeler, & Rajar, 1996).

Verbalizing the traumatic memory may have a particularly important influence on

those non-verbal aspects of the memory, which are those aspects of the memory that are not easily put into words (e.g., sensory memory, memory for characteristics of the perpetrator's face). Research shows that generating a verbal description of a non-verbal memory can decrease the accuracy of the original memory and interfere with later recognition of the visual stimulus (Chin & Schooler, 2008; Kinlen, Adams-Price, & Henley, 2007). This decrease in accuracy can be attributed to the Verbal Overshadowing Effect, which occurs when one attempts to articulate a memory that cannot be fully captured in words. This phenomenon was first observed by Schooler (1990) when he asked participants to view a simulated crime and then identify the perpetrator from a series of pictures. Participants who wrote down the description of the perpetrator's face prior to attempting to identify him were less successful at correctly identifying the criminal. When participants described the face in words, their memories changed to accommodate their written descriptions.

Schooler hypothesized that verbalization of a sensory memory (either auditorily or through writing) produces a transfer inappropriate processing shift in which cognitive operations engaged during verbalization dampen the activation in the regions associated with non-verbal operations. That is, the act of putting a visual picture into words interferes with the ability to remember the visual picture later. Verbalization is thought to be an "inappropriate" retrieval of a holistic, sensory stimulus (Meissner, Brigham, & Kelly, 2001), and the verbalization of these memories may interfere with subsequent accuracy of recall by overshadowing the original memory trace. Meissner et al. (2001) suggest that the verbal overshadowing effect occurs when a verbal description contains incorrect information, which in turn, acts as misinformation and becomes incorporated

into the memory. Verbal overshadowing research has focused primarily on nonverbal memories, such as memories for faces, tastes, and mental maps (Schooler & Engstler-Schooler, 1990; Perfect, Hunt, & Harris, 2002; Fiore & Schooler, 2002). Such perceptual memories may comprise important parts of a victim's traumatic memory. Beyond these types of perceptual memories, the full scope of memory susceptible to the verbal overshadowing effect remains unclear, and this effect has yet to be examined with respect to traumatic memory.

Recall in the presence of another person. When a trauma survivor seeks treatment for PTSD symptoms, he or she is frequently asked to disclose the traumatic memory to a therapist. This can be a difficult task if important pieces of the client's memory are missing or are not consciously accessible. In order to tell a coherent story, the client may fill in gaps in memory, either consciously or unconsciously. Our social structure encourages the telling of memories in a way that not only gives coherent and sequential information about past personal experience, but also does so in a socially interesting way (Fivush, Haden, & Reesem, 1996). Therefore, trauma survivors may alter details of the trauma narrative in the service of holding the attention of the therapist, eliciting a desired emotion, or making sense of the event (Tversky & Marsh, 2000). Similarly, the client may choose to omit aspects of the memory that may not be considered socially desirable, and may similarly omit portions of the narrative considered too laden with pain, guilt, or shame to share with the therapist. Selective recall of some aspects of the memory, but not others, may strengthen associations and protect memory for those aspects recalled, while simultaneously weakening memory for those aspects that were omitted from recall. Similarly, altering the trauma account in an effort to increase therapist interest may

introduce misinformation and thereby increase the likelihood that the client will recall the altered details as true during later recall.

Through a review of the cognitive and experimental literature, we see that several of the techniques used in exposure-based trauma treatments have been shown to influence memory in a variety of ways within experimental settings. Although the experimental literature in this area does not inspire specific predictions about how these techniques affect the accuracy of the memory, the results of these studies, taken together, do suggest that therapy is not innocuous in its relationship with traumatic memory.

Memory Change from Pre- to Post-Intervention

Despite the similarity between the techniques that have influenced memory in laboratory settings and the techniques used in trauma focused therapies, only a small body of research has explored the potential influence of psychotherapeutic interventions on traumatic memory. Some studies have examined the consistency of clients' reports of traumatic events, a construct closely related to traumatic memory, from pre- to post-therapy. Although certainly there exist a variety of reasons why a client may report a traumatic event at one time point but not another, we cannot rule out that changes in the client's ability to remember the event, or lack thereof, as a contributing factor.

Surprisingly, studies that have examined changes in the reporting of traumatic events from pre- to post-treatment have not done so with a trauma focused therapy, and few have distinguished between PTSD and non-PTSD trauma-exposed samples.

Kremers et al. (2007) found that 46 of 47 borderline patients had inconsistent responses regarding their personal trauma history, when assessed before and after 27 months of intensive treatment with either schema focused therapy or transference psychotherapy.

One limitation of this study, and indeed a limitation of most studies that rely on participant self-report, is the inability to discern whether or not the patients truly remembered the event in the first place, or whether they knowingly, falsely reported remembering the event. Ouimette, Read, and Brown (2005) examined the consistency of traumatic events reported by substance dependent inpatients at pretreatment and six months later, as measured with the Life Event Checklist (Wolfe, Kimerling, Brown, Chrestman, & Levin, 1996). Twenty-six percent of the sample was consistent across these two time points, 60% made one or two changes, and the remaining individuals (14%) reported greater than two changes. In interpreting these results, it is important to consider the role of other factors in contributing to the observed changes. For instance, changes in reporting a “no” or “yes” in response to a particular item may be the result of a reconceptualization of the event as more or less traumatic than originally believed, rather than a true remembering or forgetting of the event itself (Ouimette, Read, & Brown, 2005), or alternatively, may be due to increases or decreases in the comfort of the participant in reporting the event.

In contrast, other studies have failed to detect substantial differences in the reporting of traumatic events over the course of therapy. Bernstein et al. (1994) observed that adult reports of child abuse remained stable over a two to six month period in a sample of 286 substance dependent outpatients. Paivio (2001) administered an empirically supported, emotion focused psychotherapy to adult survivors of childhood abuse, 57% of whom met DSM criteria for PTSD at pre-treatment, and concluded that abuse reports were consistent between the start of treatment and six months later, despite a significant reduction in PTSD symptom severity. Both studies measured abuse

reporting with the Childhood Trauma Questionnaire (Bernstein et al., 1994), which uses precise behavioral descriptions of abuse rather than subjective terms such as “abuse” or “maltreatment.” Use of these behavioral descriptions limits the degree to which changes in the conceptualization of the queried event affect the response. Both studies, however, faced limitations that restrict the generalizability of their findings. First, both assessed the memory for trauma that occurred during childhood, in the remote past. Second, results were based on a comparison of the total number of traumatic events reported, as opposed to item-by-item analysis. That is, two changes in opposite directions would equal the same score (i.e., changing one previously “yes” response to a “no” and changing another previously “no” response to a “yes.”) Another limitation, as it pertains to traumatic memory, which is shared by all studies that assess change in trauma reporting over the course of therapy is that change in abuse reporting from a “no” to a “yes”, for example, represents a dramatic change in memory. Thus, if such a change were attributed to a change in memory, it would indicate that a previously unremembered event is now accessible, or the opposite, that a previously remembered event is now forgotten. The type of design used in the above studies is not highly sensitive and does not allow for the detection of less substantive changes in memory. This lack of sensitivity is particularly problematic in light of research showing that even when some details of the traumatic memory change, victims are adept at maintaining the ‘gist’ of the experience (Porter & Peace, 2007).

Empirical data suggest that other, less dramatic changes in memory over the course of treatment may occur, and appear to extend beyond trauma-specific memory. Nishith, Weaver, Resick, and Uhlmansiek (1999) assessed changes in memory

functioning after treatment with either CPT or PE. Participants were PTSD positive rape survivors who completed the logical memory subtests of the WMS-R (Wechsler, 1987) prior to treatment, and again at post-treatment. Results indicated that individuals treated with either CPT or PE showed improvement in memory functioning after therapy, evidenced by their ability to hold more information over the course of a delayed recall test ($p < 0.01$). A trend indicated that improvements demonstrated by the treatment group were greater than those of the waitlist control group ($p < .10$). Although these findings demonstrate improvements in one specific aspect of memory ability (i.e., delayed recall for verbal information), the extent to which memory improvements over the course of treatment may extend to include increased ability to recall the traumatic event itself remains unexplored.

Although previous studies indicate that changes in the yes/no reporting of traumatic events and memory *ability* appears to change with therapy, no known study has specifically evaluated the consistency and accuracy of a trauma survivor's memory of the event over the course of treatment. Despite a lack of empirical data, numerous clinical observations attest that change in traumatic memory does occur during therapy. Nishith, Weaver, Resick, and Uhlmansiek (1999) observed an increase in coherence and organization of traumatic memories during treatment; "Clinically, we have observed patients spontaneously organizing their original memories for traumatic events with continued involvement in either one of the two therapies [CPT or PE]" (p. 52). Moreover, Leskin and colleagues (1998) have called the reactivation of additional details, as increased memory for previously inaccessible aspects of the trauma an "expected

consequence” of exposure treatment, concluding that “memory recovery is a normal part of established, empirically supported therapies for PTSD” (p. 999).

Narrative Studies

Change in traumatic memory over the course of time has also been assessed using narrative analysis, which allows for detection of nuances that may be less substantial than a diametric change in the reporting of the traumatic experience. A recent meta-analysis by O’Kearney and Perrott (2006) reviewed nineteen narrative studies and identified that these studies have evaluated trauma accounts with respect to organization (e.g., van Minnen et al., 2002), length (Foa Molar, & Cashman, 1995), lexical properties (e.g., Alvarez-Conrad et al., 2001), sensory impressions (Murray et al., 2002), emotional intensity (Englehard et al., 2003), and self-reference (Halligan et al., 2003). Although analysis of trauma narratives is a popular technique, most researchers have examined the narratives of a non-treatment seeking population (Amir et al., 1998; Klien & Janoff-Bulman, 1996; van der Kolk & Fisler, 1995; Gray & Lombardo, 2001; Harvey & Bryant, 2001), and fewer studies have examined narrative changes within the context of trauma-focused treatment (Zoellner, Alvarez-Conrad, Foa, 2002; Foa et al., 1995). Within this small body of research, narratives have been most commonly analyzed with respect to their structural features (O’Kearney & Perrott, 2006), such as length, complexity (e.g., reading level index), and fragmentation/organization (e.g., temporal order). Several changes in trauma narrative structure over the course of treatment have been consistently observed; with multiple versions, narratives tend to increase in length, organization and coherence (Foa et al., 1995; Zoellner, Alvarez-Conrad, & Foa, 2002).

Comparatively less attention has been given to analysis of narrative content (Tuval-

Mashiach et al., 2004). Foa, Molnar, and Cashman (1995) conducted a comparison of PTSD-positive sexual assault victims' written accounts from pre- to post-treatment with PE. Participants were successful treatment completers who demonstrated substantial symptom reduction in therapy. Results reflected a trend such that later narratives included a higher proportion of thoughts and feelings related to the event and a smaller proportion of actions and dialogue. In a replication and extension of this study van Minnen, Wessel, Dijkstra, and Roelofs (2002) examined narrative changes in both improved and non-improved PTSD patients who participated in a full course of PE. All narratives demonstrated decreased focus on external events (e.g., perpetrator's behaviors) with a corresponding increase in focus on internal events (e.g., emotions, thoughts). In a similar vein, Alley (2008) coded narratives from 39 PTSD-positive, female interpersonal assault victims who demonstrated either substantial or moderate treatment gains with PE. This study examined the structural format of the narratives, and examined the content of the narrative with respect to thoughts, feelings, and beliefs. The proportion of thoughts, feelings, and behaviors included in the narrative was significantly related to treatment outcome. In summary, narrative studies have observed significant changes in structure, and to a lesser extent, the content of trauma narratives over the course of treatment.

Previous study has primarily concerned itself with narratives completed throughout participation in PE, a predominately exposure based therapy (i.e., an intervention that targets PTSD symptoms by exposing survivors to their traumatic memories and associated emotions and having them habituate to this experience). However, cognitively-based therapies for trauma have been shown to be similarly effective in treating PTSD (Resick et al., 2002) and may pull more changes to traumatic memory

given that cognitive therapy produces substantial schematic shifts, and current schemas influence past memories (Brewer & Teyens, 1981). To date, little is known about how exposure-based and cognitively based trauma interventions may differentially impact traumatic memory.

Although empirical data, clinical observations, and narrative analyses have consistently identified changes in memory over the course of treatment, no study has specifically examined trauma narratives for changes in the amount of factual detail pertaining the assault itself, or for factual inconsistencies between multiple versions of a trauma narrative.

Memory Change as Therapeutic Mechanism

Although memory change over the course of therapy has been observed clinically, it has been traditionally conceptualized as a potential byproduct of therapy, rather than a central mechanism of change. Empirically supported trauma therapies do not specifically aim to reduce symptoms by prompting a client to remember a greater or lesser proportion of the trauma, or to remember factual details of the trauma differently than they did prior to therapy. However, changes in memory that result over the course of therapy may not be a simple byproduct of healing. Rather, these changes may exert a powerful influence on the relationship between treatment and symptom reduction. That is, changes in memory may facilitate healing.

Several researchers have suggested that memory manipulation may serve as a cognitive coping strategy for trauma survivors (Kos, Aurelio, Bell, Tharan, & Tromp, 1995; Briere, 1996; Koutstaal & Schaacter, 1997). One such strategy consists of minimizing the memory of sensory and emotional experiences at the time of trauma in an effort to

minimize distress. Consistent with this viewpoint, Pynoos and Nader (1989) observed that children who had been exposed to sniper gunfire while playing a schoolyard underestimated their physical proximity to danger, presumably in an attempt to decrease their perception of life threat. Adults who were exposed to the same sniper fire changed their recollection of their emotional experience at the time of the shooting over a period of one year (Schwartz, Kowlski, & McNally, 1993). Diminishments in the victims' emotional experience at the time of the shooting (e.g., recalling feeling less angry at the time of the event at time two than at time one) and decreases in memory for life threat were associated with fewer intrusive memories and lower levels of both anxiety and depression, indicating that manipulating memory for the details of the event, or its associated emotions, may serve as a successful coping strategy in the aftermath of trauma.

To date, no study has examined the consistency of memory from pre- to post-treatment with respect to factual memory for the details of the traumatic experience. The limited amount of research in this area, despite provocative clinical observations, seems to suggest that scientists and practitioners assume that the therapeutic process will have no significant bearing on the content, clarity, or accuracy of the client's memory. The assumption that trauma-focused treatment acts as an innocuous agent on memory appears unlikely in light of research illustrating the malleability of traumatic memory, as well as an emerging body of evidence demonstrating the influence of therapy techniques on memory in laboratory settings.

The present study seeks to address this gap in the literature by assessing the consistency of client-reported details about the traumatic event during a course of trauma-

focused treatment. This study hopes to contribute knowledge about the function of memory in the healing process of trauma survivors by moving toward a more comprehensive understanding of changes in memory that may occur within the context of treatment.

Study Objectives

The present study will use trauma narratives written by PTSD positive, female survivors of interpersonal assault over the course of trauma-focused therapy and will assess four primary objectives. The first objective is to examine the relationship between participants' self-reported clarity of memory for the traumatic event and number of details included in the first written trauma narrative. The second aim is to examine the relationship between the number of written narratives completed and narrative change, with respect to both content and quantity of peritraumatic detail. The third aim is to examine the relationship between narrative change and treatment outcome. The fourth and final objective of the study is to explore patterns and themes in observed changes in the content of detail pertaining to the assault over the course of multiple narratives. These specific aims are explicated in the following specific study hypotheses:

Hypotheses

1. Participants' self-reported ability to remember important details of the trauma, as measured by item C3 (*"Have you had difficulty recalling important aspects of the event?"*) on the Clinician Administered PTSD Scale (CAPS) at pre-treatment, will positively correlate with the total number of peritraumatic details included in the initial trauma narrative.

2. In a comparison of first and final narratives, participants who completed *five* written trauma narratives (i.e., 5-narrative condition) will differ from those participants who completed *two* written narratives (i.e., 2-narrative condition) on a number of variables.

Hypothesis 2A. There will be a main effect for time such that amount of peritraumatic detail will increase from the first to final written narrative for all participants (collapsing across condition). It is further hypothesized that there will emerge an interaction such that participants in the 5-narrative condition will demonstrate greater increases in amount of peritraumatic detail than those participants in the 2-narrative condition.

Hypothesis 2B. In a comparison of first and final narratives, participants in the 5-narratives condition will demonstrate more inconsistencies for peritraumatic detail than participants in the 2-narrative condition.

Hypothesis 2C. There will be a main effect for time such that traumatic memory impairment, as measured by item 29 on the Posttraumatic Diagnostic Scale, will decrease from the first to final written narrative for all participants. It is further hypothesized that there will emerge an interaction such that from the first to final narrative, participants in the 5-narrative condition will demonstrate greater decreases in traumatic memory impairment than those participants in the 2-narrative condition.

3. Among those participants in the 5-narrative condition, a greater number of inconsistencies in peritraumatic detail between the first and final narrative will predict lower PTSD severity at post-treatment, as measured with the CAPS. Participants from the 2-narrative condition will not be included in these analyses given that they

participated in a different treatment protocol after completing their two written narratives. Thus, comparisons between 5-narrative and 2-narrative participants on post-treatment outcome would be confounded by differences in the treatment protocols.

Methods

5-Narrative Condition. The current study uses archival data from 19 female interpersonal assault survivors who participated in a large-scale treatment trial comparing manualized CPT to its two constituent components, cognitive therapy and written exposure. The study was supported by a grant from the National Institute of Mental Health (Grant # R02-MH51509) awarded to Dr. Patricia Resick. Participants were recruited through a variety of strategies including referrals, flyers, and media advertisements. Eligible participants reported experiencing a sexual or physical assault in childhood or adulthood, were at least three months post-trauma, and met full criteria for PTSD at pre-treatment. If on medication, participants were asked to remain stable on this medication throughout participation in the study. Exclusionary screening criteria included active psychosis or delusions, active suicidal ideation, current alcohol and/or substance dependence (within past 6 months), and medication instability. The study was conducted at the Center for Trauma Recovery at the University of Missouri-St. Louis (UMSL). Primary findings of this study were previously published (Resick, Galovski, Uhlmansiek, Scher, Clum, & Yinong, 2008). Pre-treatment assessments were conducted by trained clinicians who collected information on the type and severity of trauma exposure, and experience of PTSD or comorbid symptomatology. Participants also completed a battery of self-report measures. Individuals who did not meet inclusion criteria or did not fully complete the initial assessment were excluded from the study.

Of the 162 individuals included in the “intent to treat” sample of the first treatment trial, 55 were randomized into the written accounts (WA) condition. Within the WA condition, 30 participants completed a full course of treatment. Narratives from all participants who had completed the first and final narrative (and had these narratives collected, copied, and archived in the client file by the treatment clinician as per project protocol) were included in data analysis, yielding a total sample of 19 participants from this condition.

The protocol for the WA treatment condition was developed to reflect the techniques and procedures used in the written accounts component of CPT. The first two sessions of the WA protocol consisted of one-hour sessions during which the therapist provided psycho-education regarding the development and treatment of PTSD and oriented the participant to written trauma narrative construction. In the subsequent five sessions, participants spent the first 15 minutes of session discussing the upcoming writing assignment and reviewing homework, and the ensuing 45–60 minutes were spent writing an account of their index (worst) trauma while stationed alone in a room. Participants received the following instructions:

“We would like you to write a description of the trauma that we have been talking about. Include your description of the bodily sensations that you experienced at the time. We want to know what you were feeling at the time of the assault. It may help you to close your eyes and imagine yourself back in the situation. Try to generate the same sensations and feelings that you experienced during the assault. While the image is vivid in your memory, jot down the details of the scene and the sensations you

experienced. Describe the assault below. Please include such details as who was there, what you were doing, where you were, how things looked, what bodily sensations you experienced, etc. Continue on the reverse side with as much detail as you need to describe your reactions.”

Following the writing period, the therapist once again met with the client and the participant read her account aloud. The therapist then encouraged the client to explore her emotional response during the writing and reading of the account, reviewed what she had learned from the assignment, and discussed changes in the accounts (i.e., details that had been added or omitted). Although protocol specifically prohibited therapists from directly challenging the client's dysfunctional statements, therapists were permitted to make nondirective, empathic comments or provide occasional psycho-education. Therapists could also encourage clients to direct their focus to certain parts of the trauma account that had been identified as “hotspots”, which are those portions of the narrative linked with intense emotion. Therapists instructed the client to complete her account between sessions if not completed during the writing period. Clients were asked to read their most recent account to themselves everyday.

2-Narrative Condition. An additional 22 female participants were recruited from a separate, ongoing treatment trial involving the administration of CPT to male and female survivors of interpersonal assault. This project was funded by a grant from the National Institute of Mental Health (Grant # 1R34-MH-074937) awarded to Dr. Tara Galovski at the Center for Trauma Recovery at UMSL. Inclusion and exclusion criteria were identical to those in the first treatment trial described previously, with the exception that this second treatment trial does not exclude males. For the purpose of the present study, however, only

narratives written by female participants were used in order to provide a gender-matched sample for comparison to participants in the 5-narrative condition. Participants completed a pre-treatment assessment during which a trained clinician collected information on the type and severity of trauma exposure, experience of PTSD symptoms, and comorbid pathologies. Participants also completed a battery of self-report measures. Those individuals who did not meet inclusion criteria or did not fully complete the initial assessment were excluded from the study.

Participants in the 2-narrative condition received protocol-driven CPT (Resick & Schnicke, 1993). During the initial treatment session, the therapist provided psycho-education regarding PTSD. For the next session, participants were asked to write an impact statement about the meaning of the traumatic event (specifically, detailing how the experience of trauma has shaped their views related to the self, others, and the world). During the second session, participants read their impact statements aloud to the therapist and discuss important themes. At this early stage in treatment, therapists are instructed to begin gentle Socratic questioning (i.e., a style of questioning that encourages the client to arrive at her own answer through critical thinking), with the goal of beginning to help the participant modify her maladaptive thoughts. During the second and third sessions, clients also begin worksheets designed to assist the participants in identifying thoughts, feelings, and behaviors. At the end of the third session, participants receive the following instructions:

“Please begin this assignment as soon as possible. Write a full account of the traumatic event and include as many sensory details (sights, sounds, smells, etc.) as possible. Also, include as many of your thoughts

and feelings as you recall having during your event. Do not stop yourself from feeling your emotions. If you need to stop writing at some point, please draw a line on the paper where you stop. Begin writing again when you can continue.”

During the fourth session, clients read their written trauma narrative aloud to the therapist, who encourages discussion of difficult or emotionally arousing aspects of the account. The client is then asked to re-write the narrative and receives the following prompt:

“Start over and write the whole incident at least one more time. If you were unable to complete the assignment the first time, please write more than last time. Add more sensory details as well as your thoughts and feelings during the incident. Also, this time write you current thoughts and feelings in parentheses (e.g., ‘I’m feeling very angry’). Remember to read over the new account every day before session.”

The therapist collects the initial written narrative from the participant. Participants read the new written trauma account aloud to the therapists during session five.

Afterwards, the client and therapist examine and discuss differences in the experience of writing the two accounts. Although clients can continue writing and reading the trauma narrative beyond session 5, the remainder of the therapy typically focuses on the cognitive component of CPT, and consists of identifying and challenging maladaptive thinking related to safety, trust, power/control, esteem, and intimacy.

Psychometric Instruments

Clinician Administered PTSD Scale (CAPS; Blake, Weathers, Nagy, Kaloupek, Klauminzer, et al., 1990). The CAPS was administered to assess for the presence of PTSD. This diagnostic interview instrument assesses the frequency and intensity of PTSD symptoms on a Likert-type scale ranging from 0 to 4. Scores yield both a dichotomous diagnostic PTSD variable and continuous measures of symptoms severity for total PTSD severity, Cluster B (re-experiencing), Cluster C (avoidance), and Cluster D (arousal). The CAPS has demonstrated sound psychometric properties (Blake, Weathers, Nagy, Kaloupek, Gusman, et al., 1995), and is presently regarded as the gold standard measure for assessing PTSD. For the purpose of the present study, PTSD symptomatology will be measured using the CAPS continuous measure of symptom severity rather than the dichotomous diagnostic variable.

Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997). The PDS is a self-report measure consisting of 26 items that assess the frequency of trauma related symptoms. Responses to each item range from 0 to 3, with higher numbers indicating greater symptom frequency. The PDS has demonstrated good internal validity and reliability in previous studies (e.g., Foa, Cashman, Jaycox, & Perry, 1997).

Data Analyses

Narrative Coding System. Narratives were coded with techniques similar to those used by Sobel, Resick and Raiablias (2009) in a study that sought to qualitatively assess a separate written component of CPT, the Impact Statement. A coding manual was developed for the purpose of the present study and includes numerous coding rules as well as examples of properly coded information (See Appendix A). Many items included

in the narrative coding system are consistent with items from the Standardized Trauma Interview (STI; Resick, Jordan, Grielli, Hutter, & Marhoefer-Dvorak, 1988) a self-report measure that has been used in several large-scale treatment trials to query important factual details of the individual's experience of the assault.

First, a coder who was blind to narrative condition and narrative number (i.e., first or final) divided the narrative into clauses, which consist of a subject and a predicate. Previous narrative researchers have observed that coding the narrative at the clause level provides a decided advantage to coding the narrative at the sentence level, as several different types of detail may be provided within the same sentence (Foa, Molnar, & Cashman, 1995; Sobel, Resick, Rabalais, 2009). Each clause was then dichotomously coded as representing a *peritraumatic detail* or a *non-trauma detail*. A peritraumatic detail is defined as information that describes either the immediate context of the assault, perpetrator or victim characteristics, assault characteristics, peritraumatic reaction of the victim, or sensory detail. Each clause representing peritraumatic detail was classified into one of five domains that encompass the core observable aspects of an experience of assault: (1) context (e.g., location of the assault), (2) perpetrator and victim characteristics (e.g., eye color of the perpetrator), (3) trauma characteristics (e.g., vaginal rape) (4) peritraumatic response (e.g., tried to hit the perpetrator) and (5) sensory detail (e.g., sounds, smells, tastes). After the peritraumatic detail was categorized, the coder further specified which details were reported and the content of the detail.

After all initial and final narratives were coded, the first and final narratives from each participant were identified so that the narratives could be compared. The narratives were also reviewed qualitatively through a side-by-side review by the principle

investigator to examine for inconsistencies that were not captured by the coding system. Through these methods, the details of the final narrative were compared to those in the initial narrative. Changes in peritraumatic detail were categorized as one of three types of change: (1) omissions (i.e., an omission of detail present in earlier version of the account, (2) additions (i.e., an addition of detail not present in the earlier version of the account), or a (3) peritraumatic detail inconsistency (i.e., detail of the same type that is inconsistent with that of the previous account). When inconsistencies were detected within the same written account, this is counted towards the participant's total inconsistency score. In cases where a within-narrative inconsistency was detected, the latter detail was used for comparison to the participant's other narrative.

The narrative coding system also tallied the number of mentions of memory difficulty made by the participant in the given narrative. Although these statements were not coded as peritraumatic detail, they represent important clinical information regarding the clarity and confidence of the participants' traumatic memory. Examples of mentions of memory difficulty include statements such as "I can't remember what happened next" or "I don't recall what month it was." Clients were not expressly instructed to make such comments when they had difficulty remembering aspects of the trauma, and when present, such comments were spontaneous on the part of the client.

Interrater Reliability. The coding team consisted of the principle investigator and an additional, independent rater who was trained by the principle investigator in applying the coding system described above. Both raters were doctoral students in the clinical psychology program at the University of Missouri-St. Louis and had previously received specialized training in trauma and PTSD. Consistent with the reliability techniques used by

Sobel, Resick, and Rabalais (2009), reliability was established over two phases. First, prior to coding research data, the raters demonstrated at least 80% inter-rater reliability based on eight training narratives that were not included in data analysis in the proposed study. Following this training period, each narrative used in the present study was coded by the principle investigator who was blind to the session number during which the account was created. Twenty percent (17) of narratives were also coded by the second, independent rater who was similarly blind to the narrative number (i.e., first or final) to ensure adherence and competence. Interrater reliability exceeded the generally accepted cut-off of 0.80 for cronbach's alpha on each narrative-related variable used in the analyses, including total number clauses ($\alpha = 0.90$), number of peritraumatic details ($\alpha = 0.95$), and mentions of memory difficulty ($\alpha = 0.88$).

Data Analytic Plan

Analyses for hypothesis 1. Hypothesis 1 predicted that participants' self-reported ability to remember the trauma, as measured by CAPS item C3 at pre-treatment, would positively correlate with the total number of peritraumatic details included in the initial trauma narrative. A Pearson-product correlation coefficient was used to assess the strength and direction of the bivariate relationship between severity of CAPS item C3 ("*Have you had difficulty recalling important aspects of the event?*") at pre-treatment and the total number of peritraumatic details included in the initial written narrative.

Analyses for hypothesis 2. The following analyses were applied to test hypothesis 2:

Hypothesis 2A. This hypothesis predicted that peritraumatic detail would increase from the first to final written narrative for all participants, with participants from the 5-narrative condition demonstrating greater increases in

amount of peritraumatic detail than those participants in the 2-narrative condition. This hypothesis was tested with a repeated-measures ANOVA to examine for a main effect of time and for an interaction between time and narrative condition for amount of peritraumatic detail in the first and final narratives.

Hypothesis 2B. Hypothesis 2B predicted that 5-narrative participants will demonstrate more inconsistencies for peritraumatic detail than 2-narrative participants. Given that no participant had more than one inconsistency and only 7 of the 41 participants demonstrated any inconsistency, Fisher's exact test (i.e., a non-parametric contingency analyses used as alternative to chi square when expected cell sizes are small) was used to examine differences between the two narrative conditions on the number of participants who evidenced inconsistencies.

Hypothesis 2C. This hypothesis predicted that traumatic memory impairment, as measured by item 29 on the Posttraumatic Diagnostic Scale, would decrease from the first to final written narrative for all participants and that participants from the 5-narrative condition will demonstrate greater increases in their ability to recall the trauma than those participants in the 2-narrative condition. Hypothesis 2C was tested with a repeated-measures ANOVA to examine for a main effect of time and an interaction between time and narrative condition for self-reported traumatic memory impairment at three time points: prior to the initial narrative, after the initial narrative, and after the final narrative.

Analyses for hypothesis 3. This third hypothesis predicted that among those participants in the 5-narrative condition, a greater number of inconsistencies in peritraumatic detail between the first and final narrative will predict lower PTSD severity

at post-treatment, as measured with the CAPS. Participants from the 2-narrative condition were not included in these analyses given that they participated in a different treatment protocol after completing their two written narratives, which would confound comparisons between the two conditions on post-treatment data. The small number of inconsistencies detected between first and final narratives in the 5-narrative condition ($n = 3$) limited the ability to evaluate the initially proposed hypothesis. Alternatively, we evaluated the ability of *narrative change* (i.e., additions and omissions) to predict post treatment PTSD severity, specifically predicting that participants who evidenced greater narrative change would report greater decreases in PTSD symptoms. The construct of narrative change was represented by two variables: *additions* (number of peritraumatic details that were included in the final account, but not the initial account) and *omissions* (number of peritraumatic details included in the initial account, but not the final account). Therefore, this hypothesis was tested with a multiple regression analysis using change in CAPS total from pre- to post-treatment as the criterion variable, and *additions* and *omissions* as the predictor variables.

Results

Demographic Data. The final sample consisted of 82 written trauma narratives completed by 41 female survivors of interpersonal assault recruited from two separate treatment trials (2-narrative condition, $n = 22$; 5-narrative condition, $n = 19$). Participants ranged in age from 19 to 60 ($M = 39.8$, $SD = 13.5$), were predominantly Caucasian (70%), and had an average of 14 years of education. Of the total sample, 28 participants (68%) reported a sexual assault as their index event during their pre-treatment assessment, compared to the 13 (32%) who reported a physical assault that did not involve a forced

sexual act. A total of 16 (43%) participants wrote about index events that occurred in childhood whereas 25 (57%) wrote about interpersonal traumas that occurred in adulthood.

Table 1 displays demographic data for all participants.

Data Screening

Prior to analyses, a number of pre-tests were conducted to assess for differences between the two narrative conditions with respect to demographic variables. Comparative analyses indicate that participants from the two conditions did not differ significantly with respect to demographic variables (i.e., age, marital status, years of education) with the exception of annual household income, $\chi^2(1) = 6.76, p = .01$. A significantly higher proportion of participants in the 2-narrative condition reported household incomes under \$30,000 per year. To control for this difference, analyses showing significant differences between the two narrative conditions were rerun using annual household income as a covariate. Given that data on household income was missing from two participants, one from the 2-narrative and one from the 5-narrative condition, these missing values were imputed using the series mode method (i.e., the missing values were replaced with the modal score of their respective narrative condition) so that the participants' narrative-related data could be included in analyses. For all other analyses, a conservative approach to missing data was utilized such that the participant's data was excluded pairwise; however, the participant's data was included in other analyses in which all relative data was present.

Descriptive Statistics. Descriptive statistics for the initial written trauma narratives are presented in Table 2. On average, narratives included 84 total clauses and 42 peritraumatic details. Number of peritraumatic details included in the initial narratives

varied widely, ranging from 4 to 135. Of the five categories coded (context, victim/perpetrator characteristics, peritraumatic response, assault characteristics, and sensory details), assault characteristics were the most commonly referenced, whereas sensory detail had the fewest number of clauses devoted to it. Results from a series of independent samples *t*-tests indicated that the two narrative conditions had similar means for each of the narrative related variables used in the analyses, including total narrative length of the initial narrative, number of peritraumatic details in the initial narrative, and mentions of memory difficulty.

Hypothesis 1 results. Results from the analyses for Hypothesis 1 do not support the initial prediction that severity of psychogenic amnesia would inversely correlate with the number of peritraumatic details included in the initial account. Participants' subjective reports of psychogenic amnesia, as assessed with the CAPS item C3 at pre-treatment, were not significantly related to the total number of peritraumatic details included in their initial narratives, ($r = 0.10$ $p = 0.56$).

Hypothesis 1 follow up analyses. Given that psychogenic amnesia did not significantly correlate with amount of peritraumatic detail as predicted, a follow up analysis was conducted in which the sample was divided into two groups: *high psychogenic amnesia* and *low psychogenic amnesia*. Those in the high psychogenic amnesia group met the generally accepted clinical significance cut-off of a 1 (once a month) or more for symptom frequency and 2 (moderate intensity) or more for symptom intensity on CAPS item C3, and participants in the low psychogenic amnesia group were those who did not meet this cut-off. The sample was fairly evenly split, with 45% of participants reporting clinically significant psychogenic amnesia at pre-treatment. Results

of an independent samples t -test revealed that participants who reported clinically significant psychogenic amnesia included a similar number of peritraumatic details in their initial narrative as did participants without clinically significant memory impairment for the trauma, $t(38) = -.237, p = .82$.

To further examine the relationship between memory difficulty and number of peritraumatic details included in the narrative, additional follow up analyses were conducted using number of mentions of memory difficulty included in the first narrative (e.g., “I can’t remember what happened next”, “I don’t recall what time it was”) as a proxy for psychogenic amnesia. The bivariate correlation between number of mentions of memory difficulty and amount of peritraumatic detail trended towards significance in an unexpected direction such that individuals who made more mentions of memory difficulty tended to include more peritraumatic detail ($r = 2.91, p = 0.07$).

Analyses were also conducted to examine the relationship between psychogenic amnesia and total narrative length. Examination of the bivariate correlation revealed a significant, positive correlation between psychogenic amnesia and total length of initial narrative such that more severe psychogenic amnesia was related to a greater number of total clauses in the initial narrative ($r = 0.318, p = 0.04$). These results indicate that higher levels of psychogenic amnesia are associated with longer narratives, but are not associated with more peritraumatic detail.

Hypothesis 2A results. Hypothesis 2A predicted that amount of peritraumatic detail would increase from first to final narrative, and that participants in the 5-narrative condition would evidence significantly greater increases in peritraumatic detail than those participants in the 2-narrative condition. Results of a repeated-measures analysis of

variance (ANOVA) indicated that observed change was not in the expected direction: the average number of peritraumatic details changed from 45 (initial narrative) to 38 (final narrative), although this decrease was not statistically significant, $F(1,39) = 1.72, p = .196$. Results did not indicate the presence of a significant interaction between time and narrative condition, $F(1,39) = 0.04, p = .841$, indicating that the two groups did not differ on changes in peritraumatic detail (See Figure 1).

Hypothesis 2A follow up analyses. To examine whether total narrative length (defined as the total number clauses) changed from first to final narrative, a repeated-measures ANOVA was applied. Results revealed that mean total narrative length was consistent from first to final narrative, $F(1,39) = 1.56, p = .219$ (See Figure 2).

Hypothesis 2A qualitative analysis. Although the results of statistical analyses indicate that the average number of peritraumatic details decreased from first to final narrative, examination of individual narratives revealed diverse trends, with 40% of the narratives increasing with respect to peritraumatic details and 60% of the participants' narratives decreasing in peritraumatic details. In addition to the observed changes in *number* of peritraumatic details, qualitative review of the narratives identified important changes in the *content* of these details.

Content change was most evident in participants' description of the assaultive act(s) perpetrated. A total of 18 participants (43%) reported a sexual act in one of their accounts that was not reported in the other. Figure 4 displays the number and type of forced sexual acts reported in the first and final narratives and evidences that these reports changed from first to final narrative with respect to the type of assaultive acts reported. In particular, three of the initial narratives disclosed detail about forced sexual

acts other than vaginal rape (e.g., kissing and fondling, manual stimulation of the perpetrator) but did not indicate that a vaginal rape took place. However, in the final narrative, these same three participants provided detail about a vaginal rape that occurred in addition to these other sexual acts. For example, one participant wrote about her experience of being sexually assaulted and forced to perform oral sex on the perpetrator in her initial narrative. In the final account, she again wrote about this act, and then detailed her experience of being vaginally raped after being forced to perform oral sex. In her first account, she had not indicated that a vaginal rape took place. Conversely, there were other participants that disclosed trauma detail in the initial narrative that was not disclosed in the second narrative. One such participant wrote about an instance of domestic abuse in her initial narrative, whereas in her final narrative she provided no description of the domestic abuse and instead focused almost exclusively on how her perceptions of blame have changed as a result of trauma. In this final narrative, only 2 of the total 137 clauses could be coded as peritraumatic trauma detail.

With respect to *physically* assaultive behaviors, participants were consistent with their reports of the majority of physically assaultive behaviors, including kicking, choking, holding underwater, pulling hair, and pushing (See Table 5). For each instance in which these behaviors were mentioned in the initial narrative, they were similarly included in the participant's final narrative. Reports of the perpetrator hitting or restraining the victim were more common in the initial narrative than the final narrative. In contrast, descriptions of shootings and stabbings were more common in the final narrative. There were two participants who omitted a severe physically assaultive behavior (i.e., a shooting and a stabbing) in the initial narrative, only reporting this detail

in the final narrative. For example, in her final narrative, one participant gave the following, detailed description of her stabbing: “[the perpetrator] stopped for a minute. Then [the perpetrator] pulled a knife from his jeans. I was thinking I wonder what he is going to do with that. Then he cut my legs, slashed my arm by my elbows and put the knife in my elbow and above it. Then he put cuts on my vagina.” These details were not included in the initial narrative. Interestingly, this participant reported no difficulty remembering important aspects of the trauma during her pre-treatment interview.

Changes with respect to the description of the victim/offender relationship within the narrative were also observed. Three participants who had been sexually assaulted by a known perpetrator did not indicate the nature of their relationship in the initial narrative, but did provide this detail in the second narrative. In all three cases, the perpetrators were family members (father, brother, cousin). In summary, although statistical analyses indicated that narratives were, on average, consistent with respect to length, qualitative analysis demonstrated important changes within individual narratives.

Hypothesis 2B results. Hypothesis 2B predicted that participants in the 5-narrative condition would demonstrate more inconsistencies between the first and final narrative than those participants in the 2-narrative condition. Results indicated that the percentage of participants with inconsistencies did not differ significantly between the 2-narrative and 5-narrative conditions (18% and 16% respectively, $p = 0.396$, two-tailed Fisher’s Exact Test).

Hypothesis 2B follow up analyses. Given that so few inconsistencies were detected, the meaningfulness of comparing the narrative conditions with respect to inconsistencies is limited. Alternatively, the narrative conditions were compared on two

variables that represent degree of change from first to final narrative: *additions* and *omissions*. When a participant included peritraumatic detail in the second narrative that had not been provided in the first narrative, this was considered an addition. The additions variable represents the cumulative number of additions. Conversely, the omissions variable is the sum of peritraumatic details included in the initial narrative but not the final. Results of two univariate ANOVAs revealed that the average number of omissions [$F(2, 40) = 1.29, p = .29$] and additions [$F(2, 40) = 1.11, p = .34$] did not differ between the two narrative conditions.

Hypothesis 2B qualitative analyses. The following is a review of the 7 inconsistencies detected in the accounts. The participants score on CAPS item C3 which assesses psychogenic amnesia is parenthetically noted alongside the qualitative description of the participant's inconsistency. Scores range from 0 to 8, with high scores indicating greater severity.

1. In her first account, the participant described being stabbed and then raped. She reversed the order of these events in the second account.
(CAPS C3 score: 0)
2. The participant described that the assault took place at 5:45pm in her first account; in her second account stated that the assault took place at 5:30.
(CAPS C3 score: 7)
3. The participant indicated in her first account that there were only two perpetrators involved in her assault. In her final account, she reported three perpetrators. (CAPS C3 score: 6)

4. The participant indicated in her first account that when she resisted, her attacker stopped: “I pushed his hand away. I think he stopped.” In her second account, she described that same portion of the event as follows: “He didn’t stop when I pushed his hand away and asked him to stop.” (CAPS C3 score: 5)
5. In her first account, the participant wrote that she could not remember whether she had a discussion with her father (who was also her perpetrator) about the sexual abuse. She wrote, “I don’t know if we talked about what happened.” However, later in that same account, she indicates that she now remembers that she did discuss the abuse with her father and even provided a detailed description of this conversation: “I remember standing in the kitchen the next day. My father was there. He told me that I had better not mention anything about last night to anyone.” (CAPS C3 score: 7)
6. In her first account, the participant indicated that she received “no apology” from her husband when he hit her. Later in the same account, she wrote that she could not remember if the perpetrator had apologized: “I don’t remember the exact words he said about why he hit or if he was sorry.” (CAPS C3 score: 0)
7. In her first account, the participant wrote that her perpetrator threatened her with the statement, “I’ll kill you.” In the second narrative, the threat changed to “I’d rather see you dead.” (CAPS C3 score: 0)

Hypothesis 2C results. Hypothesis 2C predicted that participants' subjective reports of psychogenic amnesia, as assessed with PDS item 29, would decrease from first to final narrative (i.e., participants would report less memory impairment in the final narrative). Prior to analyses, variables were screened to ensure that the assumptions of ANOVA were met. Results indicated that the distribution of the dependent variable (i.e., PDS item 29 scores) met all assumptions of univariate normality. Results of a repeated-measures ANOVA indicated that within the entire sample, scores on item 29 of the PDS did not change significantly across the three time-points of assessment: (1) prior to writing the initial narrative, (2) after initial narrative, (3) after the final narrative, $F(2, 37) = 1.35, p = .27$. Changes in mean scores for psychogenic amnesia for each narrative condition across these three time points are displayed graphically in Figure 6. Visual inspection of slopes suggests that the separate narrative conditions evidenced distinct changes in psychogenic amnesia from first to final narrative, with the mean psychogenic amnesia score increasing for participants in the 2-narrative condition, and decreasing for participants in the 5-narrative condition. Results of statistical analysis indicated the presence of a significant interaction between narrative condition and changes in PDS scores, $F(2, 37) = 3.54, p = .04, \eta^2 = .16$.

Hypothesis 2C follow-up analyses. To further examine changes in participants' ability to remember the traumatic event, number of mentions of memory difficulty within the narrative was again used as a proxy for psychogenic amnesia. Results of a repeated-measures ANOVA indicated a significant main effect for time such that the number of mentions of memory difficulty in the first narrative ($M = 1.5, SD = 2.5$) was significantly greater than the number of mentions of memory difficulty in the final narrative ($M = 0.6,$

SD = 1.2), $F(1, 39) = 9.73, p < .01, \eta^2 = .20$. This finding remained significant even after controlling for differences in annual income between the two narrative conditions in a repeated measures ANCOVA, $F(1, 38) = 12.76, p < .01, \eta^2 = .25$. Results did not indicate the presence of a significant time by narrative condition interaction, $F(1, 38) = 0.038, p = .89$.

Hypothesis 3 results. Hypothesis 3 initially predicted that for participants in the 5-narrative condition, a higher number of inconsistencies would predict lower PTSD severity at post-treatment, as assessed with the CAPS. Given that the small number of inconsistencies detected between first and final narratives in the 5-narrative condition ($n = 3$) limited the ability to evaluate the initially proposed hypothesis, we alternatively evaluated the ability of *additions* and *omissions* to predict post treatment PTSD severity. Results of a multiple linear regression analysis indicated that the overall model was significant, $F(1,17) = 4.06, p = 0.01, R^2=0 .54$. However, the number of additions significantly predicted post-treatment CAPS scores in an unexpected manner; a greater number of additions were predictive of more severe PTSD symptoms at post-treatment, $\beta= 0.50, p = 0.02$. The number of omissions failed to significantly predict post-treatment CAPS scores, $\beta= -0.18, p = 0.42$.

Hypothesis 3 Follow up Analyses. Results of the analyses for hypothesis 3 indicated that more additions predicted more severe PTSD symptoms at post-treatment for those participants in the 5-narrative condition. A linear regression analyses was used to examine whether the amount of peritraumatic detail in the first or final narrative could predict post-treatment PTSD symptoms. Follow-up analyses revealed that after controlling for pre-treatment PTSD severity, greater peritraumatic detail in the final

narrative predicted more severe post-treatment symptoms, $\beta = 0.73, p = 0.002$. The number of peritraumatic details in the initial account was unrelated to post-treatment symptom severity.

Discussion

Hypothesis 1 Discussion

Results did not support the hypothesis that higher levels of psychogenic amnesia would inversely correlate with amount of trauma-specific detail included in the written trauma narrative. Indeed, follow up analyses yielded the unexpected finding that individuals who made more mentions of memory difficulty tended to include more peritraumatic detail. There exist several possible explanations for the absence of the hypothesized relationship between these variables. First, clients may have simply included numerous details about those portions of the trauma that they do recall. That is, participants may have been able to give very detailed accounts of recalled aspects of the trauma, despite being unable to remember important parts of the event. In the present study, and indeed with most studies on traumatic memory, it was not possible to assess the written trauma narratives for completeness or thoroughness because the participant's version of the traumatic event was the only version available to the researchers. Therefore it is unclear to what extent participants did, in fact, omit important parts of the event.

A second possibility is that participants' subjective impression of memory impairment does not provide an accurate assessment of the amount of trauma detail she can remember. Such a finding would indicate a problem with metamemory (i.e., self awareness of memory) rather than true recall ability. Simply put, participants who report

psychogenic amnesia may be able to remember more than they believe possible and when actively trying to retrieve the trauma memory in the context of writing the assault account, participants may have found themselves able to remember more details than they had anticipated. A third possibility is that perhaps participants indicated that there are important parts of the event missing from memory as an avoidance strategy, in hopes that they would not be expected to share these details later in therapy.

Although exactly *why* participants who report psychogenic amnesia do not appear to include fewer trauma details remains unclear, clinicians should note that trauma clients who report memory difficulty produce accounts that are similarly rich in traumatic detail to those who do not report memory difficulty. Participants who report memory impairment for the trauma should not immediately be assumed inappropriate for completing a written account or other form of exposure-based therapy. Indeed, follow up analyses yielded the surprising result that individuals with more severe ratings of psychogenic amnesia included comparable amounts of peritraumatic detail as those individuals who did not report memory difficulties, and in fact wrote significantly longer narratives. Future studies should examine whether the increased length of the narrative, and presumably the inclusion of more non-trauma details, is an effort at avoidance, or an attempt to compensate for lack of ability to remember important trauma-related details.

Hypothesis 2A Discussion

The hypothesis that the amount of peritraumatic detail would increase from first to final narrative was not supported by results. One of the clinical rationales for having clients complete a second written trauma narrative over the course of CPT is for them to have the opportunity to add any details that they glossed over in the first account. Resick

and Schnicke (1993) make the clinical observation that the first written trauma narrative often reads like a police report, and the second version provides clients the chance to include those details that they left out in the first narrative. However, the finding that the amount of peritraumatic detail did not increase from first to final narrative indicates that clients may not be engaging in this expected process. Previous empirical research suggests that written trauma narratives are effective in reducing PTSD symptoms; thus, it is possible that the mechanism of change behind the effectiveness of trauma narratives is not related to the amount of trauma-specific detail within the account. Alternative mechanisms include the clients' experience of disclosing the trauma in a supportive environment (while reading the account to the therapist) and cognitive change about the causes of the assault. Moreover, the present study's finding that peritraumatic detail decreases despite narrative length remaining constant indicates that participants are dedicating an increasing proportion of their final trauma narrative to non-peritraumatic detail. It is possible that the mechanism of change is related to these non-peritraumatic details, which may involve processing thoughts and feelings about the trauma and therapy. Furthermore, the finding that trauma-specific detail does not increase with multiple iterations of the accounts underscores the need to further examine the mechanism of change behind written narratives so that clinicians can encourage clients to focus on those aspects of the narrative (e.g., emotional processing, traumatic details) that are most responsible for symptom reduction.

The present study's finding that total narrative length was consistent from first to final appears inconsistent with previous research indicating that narrative length increases with multiple iterations (Foa, Molnar, & Cashman, 1995). Differences in design may

account for the discrepant findings reported by the present study and Foa et al.'s study with respect to narrative length. Foa and colleagues examined oral narratives that were videotaped, transcribed, and then coded, whereas the narratives included in the present study were written accounts. An oral account of a trauma may be influenced by different demands than a written account (i.e., immediate presence of another person) and therefore may exhibit a different pattern of change over time.

Although narratives in the present study were consistent with respect to total length and number of peritraumatic details, qualitative analysis indicated that there were important changes with respect to the content of the trauma-specific information disclosed in the narratives. It was commonly observed that participants included important trauma details (e.g., assaultive acts, victim/offender relationship, etc.) in the second account but not the first, and vice versa. This finding has potential clinical and legal implications. Clinically, it may be important for the therapist to explore with the client her reasons for omitting specific details in one of the narratives. It remains unclear why participants in the present study selected to disclose certain detail in one account but not the other; this could be the result of a conscious decision to exclude information (i.e., avoidance) or a genuine inability to recall certain details at one of the time points, and may differ from client to client. If the client is able to identify that an omission is resulting from avoidance, the therapist and client can address this issue together. Given that many of the participants are often not producing a comprehensive trauma account during either the first or second account, and that on average only half of the narrative is devoted to peritraumatic detail, it may also be worthwhile for trauma-specific protocols to consider changes to narrative instructions in an effort to maximize compliance with the

spirit of the assignment (e.g., providing further examples of the type of information that one *would* and *would not* be expected to include in the narrative, outlining the narrative verbally so that the therapist can encourage the client to stay focused on trauma-related material).

For trauma survivors involved in legal proceedings, it may be helpful for counsel to ask very specific questions to elicit the most complete version of the trauma on the first recall attempt in order to capture more comprehensive detail about her memory of the event. Alternatively, it may be important for legal counsel representing the survivor to request that the victim describe her trauma multiple times, given that some survivors appear to report details during one recall attempt but not another. Future research should compare the details included in spontaneous recall attempts (e.g., written narratives where the client chooses what details to disclose and which details to withhold) with structured interviews that ask specific questions about the trauma.

Overall, the results of this study indicate that when treatment-seeking assault survivors are asked to write a detailed description of the trauma as it occurred, important trauma-related details may be omitted. It remains unclear the extent to which these omissions are due to psychogenic amnesia, or other factors.

Hypothesis 2B Discussion

A small portion of the total sample (14%) did evidence an inconsistency with respect to peritraumatic factual detail. The infrequency with which contradictory details were detected suggests that narratives remain relatively stable over multiple iterations, with little conflicting information. Moreover, the content affected by the majority of these inconsistencies did not typically affect central details of the assault, and instead,

have to do with more minor contextual aspects (e.g., the exact time of the assault, minor changes in reports of the what the perpetrator said during the assault.) This supports the notion that when involved in legal proceedings, interpersonal assault survivors are likely able to provide consistent testimony. However, it should be noted that the present study was not able to evaluate the accuracy of these details.

Quantitatively, these results of the present study indicate that completing multiple iterations of the trauma narrative do not appear to be linked with greater inconsistencies within the trauma narratives. This finding appears inconsistent with previous non-traumatic memory research that links greater memory intrusions with repeated recall attempts (Henkel 2003; Goernet, 2005; McDermott, 2006), and it is possible that there exists a unique aspect of traumatic memory that renders it more impervious to the deleterious effects of repeated recall that have been observed with other types of memory. Interestingly, participants who demonstrated an inconsistency represented a large range of psychogenic amnesia severity with some participants reporting that they had clinically significant amnesia and others reporting that they had no difficulty remembering important aspects of the trauma. This indicates that inconsistencies may be observed even in clients who are remarkably confident in the completeness of their memory. Although it is beyond the scope of the present study to compare the clinical features of this subsample to those who did not evidence an inconsistency, future research should examine whether the presence of inconsistencies may provide relevant clinical information.

Hypothesis 2C Discussion

The present study did not detect significant changes in participants' assessment of

their ability to recall important aspects of the event after completing their narratives.

Although there may have been individual participants who remembered previously unrecalled aspects of their trauma, on average, participants reported that they were able to recall the same proportion of important trauma details both before and after writing their narratives. This finding may serve to normalize this experience for trauma clients who are frustrated by their inability to recall important aspects of the event, and are disappointed when their experience of constructing the narrative does not assist them in remembering more details about the trauma. Increased recall of the trauma may not be a typical or necessary component for success in PTSD treatment.

It is notable that the two narrative conditions evidenced distinct patterns of change with respect to psychogenic amnesia. Psychogenic amnesia decreased between the first and final narrative for participants in the 5-narrative condition, whereas psychogenic amnesia increased for those in the 2-narrative condition. The overall finding that change in psychogenic amnesia was nonsignificant may therefore be the result of changes of opposing directionality in the two conditions (i.e., one condition decreased, one condition increased), thereby neutralizing the results. It is possible that that psychogenic amnesia does decrease with multiple written narratives, but that this effect was not observable after only two narratives. Additionally, the significant decrease in the number of mentions of memory difficulty from first to final narrative suggests that there may be some increase in the participants' confidence in the traumatic memory, even if they did not directly report being aware of such an improvement. It is not known whether clients' actual recall ability for important aspects of their trauma changes throughout the course of therapy.

The finding that participants were no more confident in their ability to remember important aspects of the trauma after completing their written narratives is inconsistent with previous research indicating that portions of an autobiographical memory that are previously unremembered are often reported as remembered after repeated retelling (Bartlett, 1932; Conway, 1992; Neisser & Fivush, 1994) and with clinical observation that trauma therapy clients often remember previously unrecalled aspects of the trauma over the course of treatment (Leskin et al., 1998; Nishith, Weaver, Resick, & Uhlmansiek, 1999). Given that the completion of trauma narratives tends to be one of many components in a trauma-focused therapy, it is possible that a subsequent aspect of therapy (e.g., cognitive restructuring, therapeutic relationship) is responsible for producing the improvements noted by clinicians. Alternatively, traumatic memories may be distinctive from other autobiographic memories in that they are less susceptible to these reconstructive effects.

Hypothesis 3 Discussion

Hypothesis three predicted that for participants in the 5-narrative condition, a higher number of inconsistencies would predict lower PTSD severity at post-treatment. However, the small number of inconsistencies detected within the 5-narrative condition ($n = 3$) limited the ability of the present study to accurately test this hypothesis. The alternative examination of the ability of additions and omissions to predict change in PTSD symptoms indicated that a greater number of additions were predictive of more severe PTSD symptoms at post-treatment. This finding is surprising given that empirically supported treatments for PTSD (e.g., PE, CPT, Group Based Exposure Therapy) encourage participants to elaborate upon the details of the trauma provided in

their initial account and view this process as an integral component of treatment (Resick & Schnicke, 1993; Foa et al., 1999). One potential explanation for this discrepancy is that those participants who evidenced a greater number of additions may have been those who included an especially small number of details in the initial account, either due to a particularly disorganized memory for the trauma or high levels of avoidance, both of which have been previously identified as predictors of PTSD severity (Van Geizen et al., 2005; Hayden, Scarpen, Jones, & Ollendick, 2007). Participants with coherent, organized memories for the trauma would seem more likely to produce a more comprehensive version of the event during the first narrative, and would therefore be less likely to add a substantial number of details during the second narrative.

Follow-up analyses yielded a similarly surprising finding that greater peritraumatic detail in the final narrative predicted higher post-treatment PTSD symptoms. The most parsimonious way to interpret this finding would be to conclude that the inclusion of a large number of trauma details in a revised written account is harmful to the client. However, such a conclusion is highly inconsistent with the large and well-developed body of research in support of the effectiveness of exposure-based therapies for PTSD (Foa et al., 1999; Resick, Nishith, Weaver, Astin, & Feuer, 2002; Resick et al., 2008). The procedures of empirically supported trauma treatments encourage clients to provide greater trauma detail with each subsequent recall based on the rationale that confronting the trauma details will serve to decrease avoidance, thereby reducing PTSD symptoms. Rather than suggest that the inclusion of a large number of trauma details in the revised account is harmful, it is possible that there is an optimum level of trauma-specific detail that when exceeded, may interfere with symptom improvement.

Limitations and Future Directions

Although the present research hopes to add to the extant literature by increasing knowledge about the function of memory in the healing process of trauma victims, this study does face noteworthy challenges. One limitation of this study is the open ended-nature of the narrative prompts. Although participants were specifically instructed to “include as many sensory details as you recall having,” omissions in details may be attributed to the participant’s willingness to write about certain details, rather than an inability to remember those details. Furthermore, the present study used a PTSD-positive sample and it is unknown how repeated revisions of a trauma narrative may differentially affect a non-PTSD, traumatized sample, especially given findings that attest to important differences in the organizational complexity of traumatic memories between these two populations (Halligan et al., 2003).

The retrospective nature of the study, combined with the absence of objective accounts of the traumas experienced by the each participant, precludes examination of the accuracy of the victim’s memory. In the present design, it is impossible to conclude whether a factual change within the account represents a more or less accurate recollection of the event as it actually occurred. There exist inherent difficulties in studying the accuracy of traumatic memory. Many traumas are consciously perpetrated in secluded areas, and frequently, the victim and the perpetrator are the only individuals present at the time of trauma. Even when an individual, be it the victim, perpetrator, or a third party witness, is able to provide an eye-witness account of the event, this account is still subjective in that it is encoded from the perspective of a witness who possesses an imperfect memory. Researchers are also restricted in their ability to perform prospective

studies, given that the replication of trauma does not lend itself easily to laboratory settings. In an effort to ensure the protection of research participants, ethical stipulations restrict the recreation of a contrived traumatic event that could induce intense feelings of fear and terror as well as the physiological arousal that is consistent with a real-life traumatic experience. Thus, conclusions pertaining to memory accuracy remain beyond the scope of the present study.

Research has not yet identified how the observed changes in narrative structure and content may reflect changes to traumatic memory, per se. Narrative changes may indicate that the trauma survivor remembers more about the trauma (i.e., recalling facts that were previously inaccessible), or that the survivor is remembering the trauma in a factually different way. Alternatively, observed differences in trauma narratives from pre- to post-treatment could also be explained by a decrease in avoidance towards thoughts, feelings, and memories associated with the traumatic event. Indeed, trauma-focused treatments aim to decrease avoidance symptoms throughout the course of treatment and have demonstrated success in reducing both the frequency and severity of avoidance symptoms of PTS (Foa et al., 1999; Resick, Nishith, Weaver, Astin, & Feuer, 2002). It is likely that narrative changes are multiply determined, and there is a need for future studies to continue to explore precisely how a client's memory for the trauma changes over the course of therapy, and how these changes may affect therapeutic success.

Table 1
Participant Demographics


	Treatment Condition			statistic	<i>p</i>
	Total Sample	2-narrative	5-narrative		
Age	M=39.8 SD=13.45	M= 43.4 SD=15.0	M= 35.8 SD= 10.5	$t = 1.98$	0.06
Race					
<i>white</i>	28 (70%)	13 (46%)	15 (54%)	$\chi^2 = 0.94$ 	0.33
<i>minority</i>	12 (30%)	8 (67%)	4 (33%)		
Marital status					
<i>married/cohabitating</i>	25 (61%)	12 (60%)	13 (68%)	$\chi^2 = .30$	0.58
<i>unmarried</i>	14 (34%)	8 (40%)	6 (32%)		
Years of Education	M = 14.6 SD = 3.0	M = 14.1 SD = 3.0	M = 15.2 SD = 2.9	$t = -1.13$	0.27
Months since trauma	M= 195.4 SD=208.1	M= 243.1 SD= 252.5	M=157.2 SD=158.0	$t = 1.43$	0.89
Household Income					
<30,000	20 (49%)	15 (68%)	5 (26%)	$\chi^2 = 6.76$	0.01
>30,000	21 (51%)	7 (32%)	14 (74%)		

Table 2

Descriptive Statistics for first and final narratives

	Total Sample	Treatment Condition	
		2-Narrative	5-Narrative
Total Clauses			
<i>first</i>	88.4	71.2	108.4
<i>final</i>	80.0	63.6	98.9
Peritraumatic Details			
<i>first</i>	45.0	37.4	50.2
<i>final</i>	38.4	26.0	47.1
Nontrauma Clauses			
<i>first</i>	43.9	36.2	52.8
<i>final</i>	41.6	33.4	51.1
Context			
<i>first</i>	1.9	1.9	2.0
<i>final</i>	1.5	1.4	1.6
Characteristics of Victim			
<i>first</i>	0.9	0.8	0.9
<i>final</i>	0.8	0.9	0.7
Characteristics of the Perpetrator			
<i>first</i>	1.5	0.9	2.1
<i>final</i>	1.1		
Assault Characteristics			
<i>first</i>	17.1	13.9	20.7
<i>final</i>	15.8	14.1	17.8
Peritraumatic Cognitions			
<i>first</i>	10.0	17.9	43.6
<i>final</i>	8.1	5.3	11.4
Peritraumatic Behaviors			
<i>first</i>	11.2	8.3	14.5
<i>final</i>	7.2	6.3	8.3
Peritraumatic Emotions			
<i>first</i>	2.7	1.4	4.2
<i>final</i>	3.1	2.4	3.9
Peritraumatic Physical Reactions			
<i>first</i>	5.9	1.9	10.5
<i>final</i>	4.5	2.4	6.8
Sensory Detail			
<i>first</i>	2.7	1.5	1.3
<i>final</i>	0.8	0.8	0.9

Figure Captions

Figure 1. Change in number of peritraumatic details from first to final narratives.

Figure 2. Change in total number of clauses from first to final narrative.

Figure 3. Number and type of forced sexual acts reported in first and final narratives.

Figure 4. Number and type of physically assaultive acts reported in first and final narratives.

Figure 5. Change in psychogenic amnesia

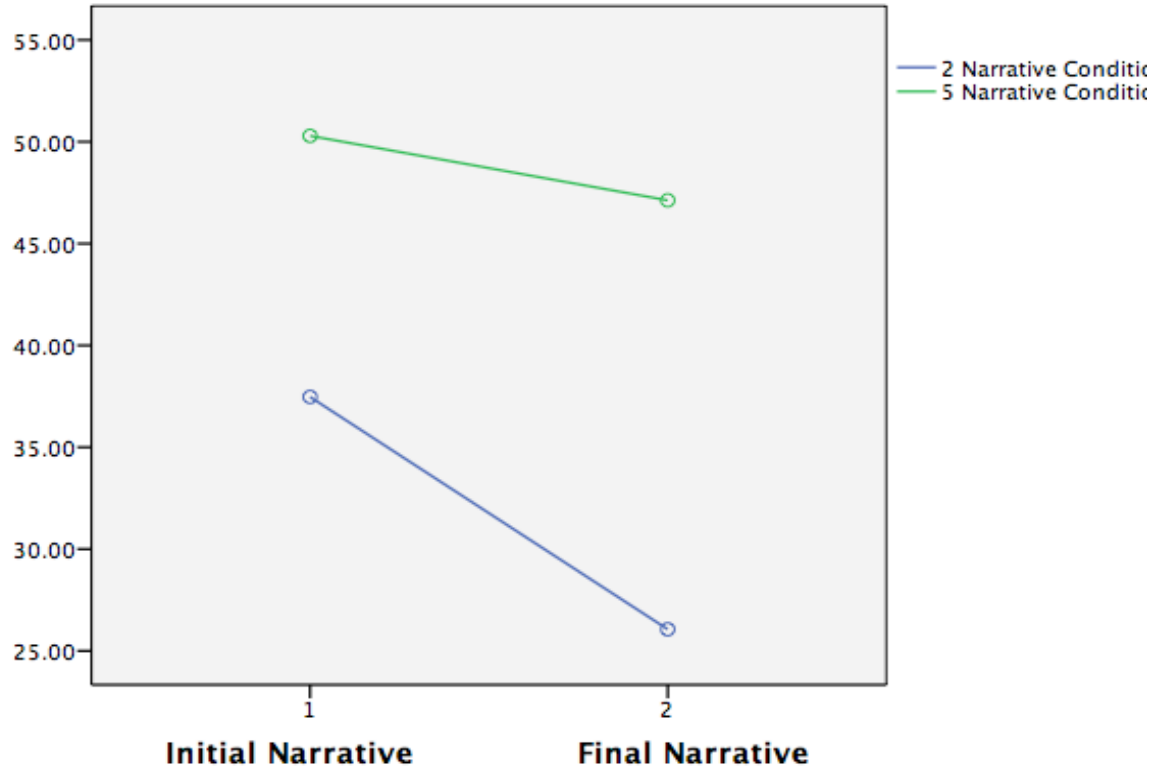


Figure 1. Change in peritraumatic detail from first to final narratives.

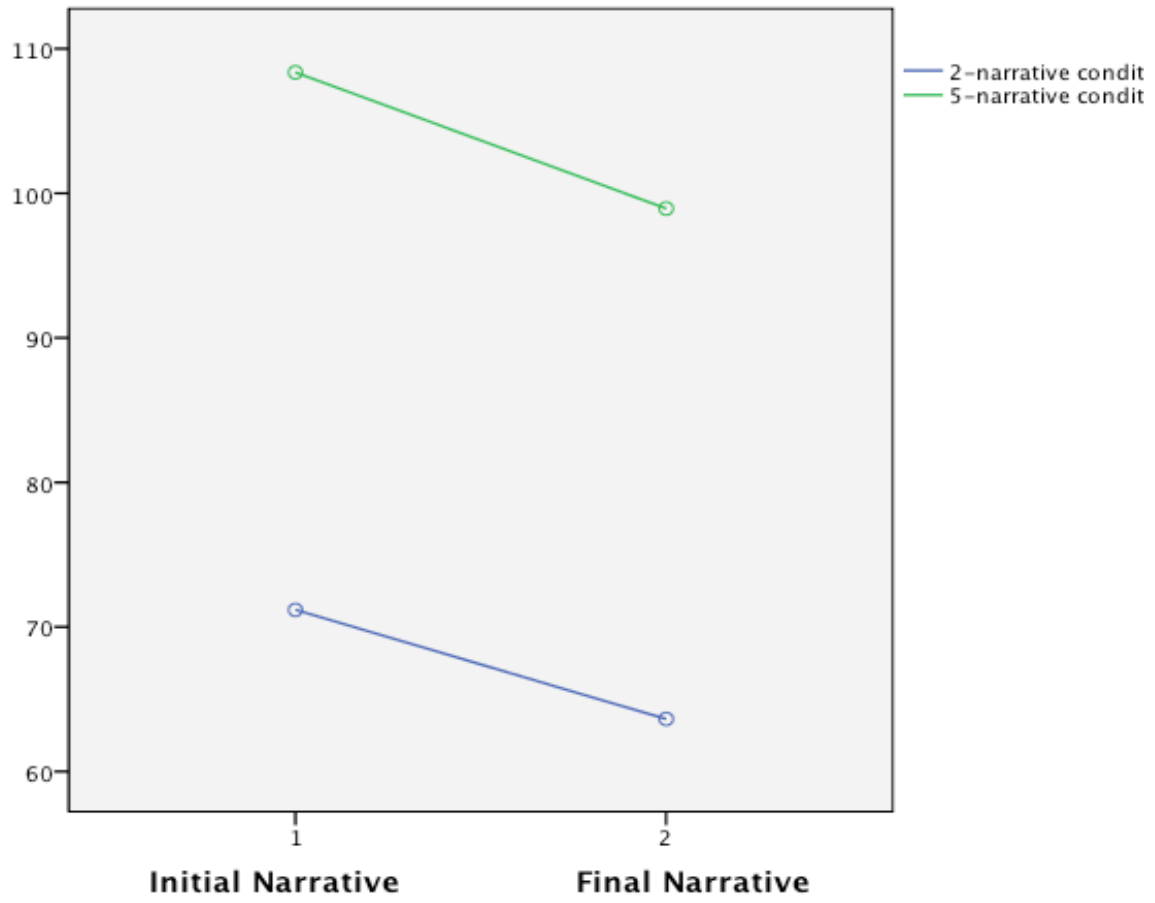


Figure 2. Change in total narrative length from first to final narrative.

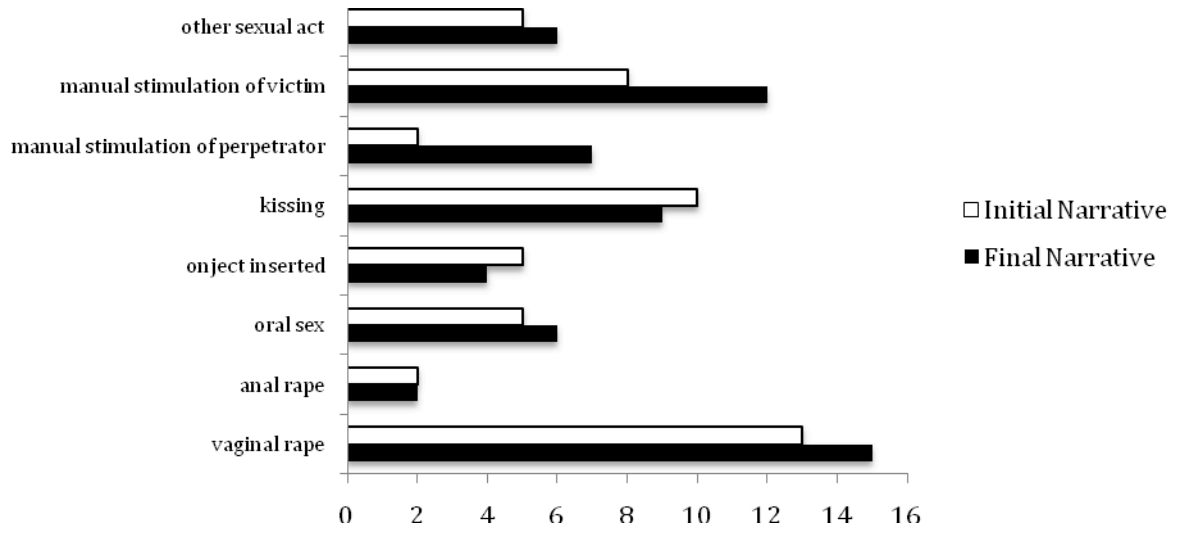


Figure 3. Number and type of forced sexual acts described in narratives.

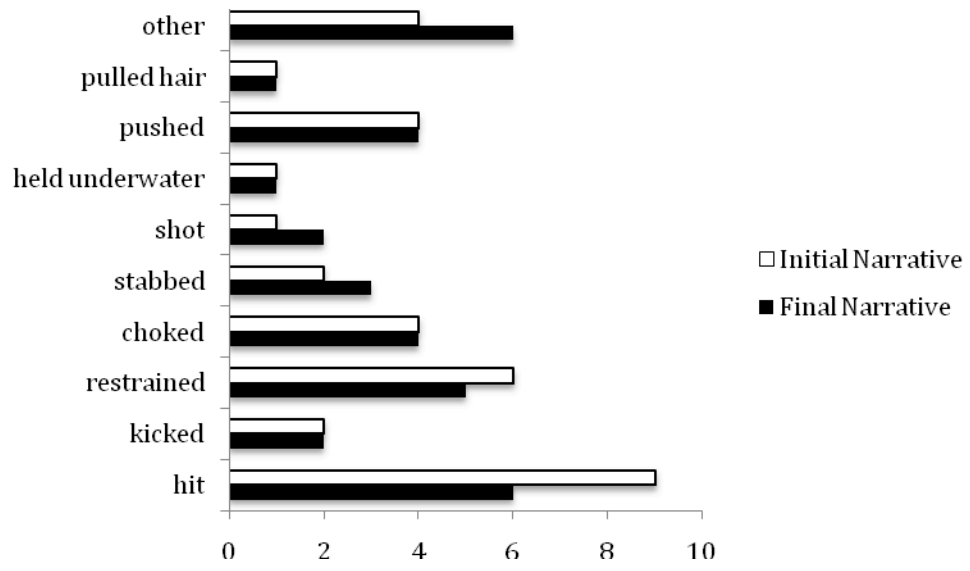


Figure 4. Number and type assaultive physical acts described in narratives.

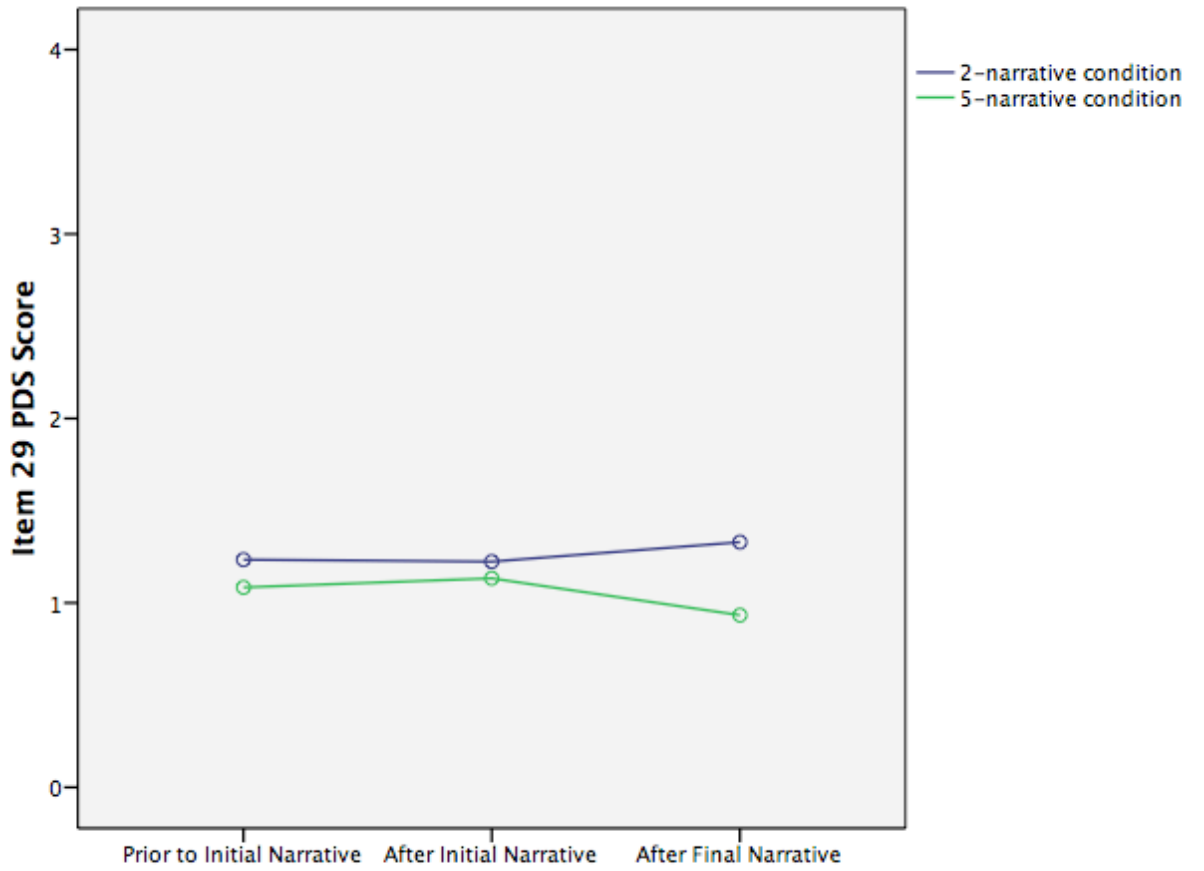


Figure 5. Changes in mean scores for psychogenic amnesia

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Appendix A.

TRAUMA NARRATIVE CODING MANUAL

PROPORTION OF DETAIL

(STEP 1)

Narratives will be divided into clauses consisting of a subject and a predicate (verb). For coding purposes, independent clauses (which can stand on their own; e.g., he went to the store) are considered to be individual clauses. Dependent clauses (which can not stand on their own, e.g., because we went to the store) will be considered part of the clause they modify.

- Clauses joined by and, but, or, for, yet, so are usually both INDEPENDENT clauses.

- Clauses joined by after, although, as, as if, because, before, even if, even though, if, in order to, since, though, unless, until, whatever, when whenever, whether, while, which, and that are usually DEPENDENT clauses.

(STEP 2) Determining the onset of Threat (HALLIGAN, MICHAEL, CLARK, AND EHLERS, XXXX)

Threat is defined as the point at which one of the following criteria is met:

- The client reports that she feels fearful, scared, afraid, uncomfortable, or threatened
- The average person would reasonably be expected to feel fearful, scared, afraid, uncomfortable, or threatened
- The participant reports the first trauma characteristic that can be coded as a 3

(STEP 3)

Each clause will then be coded as either representing an assault detail (*Code as 1, 2a, 2b, 2c, 3, 4a, 4b, 4c, 4*) or not representing an assault detail (*Code as 0*). A detail pertaining to the assault is defined as information that falls under one of the following domains:

(0) No trauma detail:

EXAMPLES:

My dad got a new job after that.

We went to visit my aunt every summer.

It took me a long time to recover.

I am scared to write this.

What happened next changed my whole life.

I think about what she did to me every day.

(1) **Context:** indication of where/when the event took place. (The client may mention the context before the onset of threat and this should still be coded.)

More than 1 location may be coded.

Do not code any context more specific than the room-level. For example, the client may indicate that the assault occurred in her bedroom (code as location detail) and on her bed (**do not** code as location detail).

EXAMPLES: She took me to the basement of her house.

He pulled me into his car.

(2) **Characteristics** of perpetrator (**2b**) or victim (**2a**).

This includes name (*code only once*), age, gender (*code only once*), and other physical characteristics such as facial features, build, clothing, etc. This category also includes relationship between victim/perp (**2c**). This category **does not** include evaluations of the perpetrator or victims appearance (e.g., he was so ugly, I felt so fat).

EXAMPLES:

(2a) **Perpetrator Characteristics**

I could see his tattoo.

He had bright blue eyes

His sweater was green

(2b) **Victim Characteristics**

I was only 9 years old

I was wearing a flowered nightgown

I had hair past my waist back then

I hadn't developed yet and my chest was still flat

(2c) **Victim-Offender Relationship**

I had met him once at a party the week before

He was my mom's brother

*may also state the relationship indirectly, such as: I never understood how my own husband could do that to me

*Code 2c only once, unless the participant provides more detailed info (e.g., first saying that it was a coworker, and later indicated that they dated for several years). If the client refers to the perpetrator by their relationship rather than his/her name (e.g., "My brother did this", "My brother did that"), code 2C only once.

(2) **Assault characteristics**

This category includes the type of trauma, acts performed by perpetrator, presence of a weapon, injury incurred, etc. This should also include any observable behavior of the perpetrator once threat is present. This can also include the observable behavior of bystanders or third parties DURING threat.

EXAMPLES: He aimed his gun right at me.

He pulled at my shirt

She said "You'll be sorry you didn't listen to me"

Then he stood up and walked away

He laughed at me

A neighbor ran over and started to pull him away from me

I heard him whisper to me that he would hurt me if I yelled

* note that the phrase "I heard" is not necessarily coded as a NOISE. Any talking done by the perpetrator is coded as an assault characteristic.

(3) **Peritraumatic reaction of victim (at time of trauma)**

Remember, time of trauma is defined as the onset of threat until the threat is no longer present. Interactions with the perpetrator after threat is no longer present do NOT count as peritraumatic (e.g., "The next week, I asked him why he did that me to" would be coded as a zero).

(4a) thoughts

EXAMPLE: I knew I was going to die

- Thoughts can be identified by phrases like "I felt like...", "I knew...", "I thought...", "I wished...", "I said to myself..."
- The content of the thought must be clear (e.g., "My thoughts were racing" would NOT be coded as 4a)

- Code praying as a thought

(4b) observable behaviors

EXAMPLE: I tried to fight him off my swinging my fist
I started to cry and yell

(4c) emotions

EXAMPLE: I felt so scared

*Do not code current emotions (e.g., I get angry and want to explode whenever I think about this!)

(4e) bodily sensations

EXAMPLE: It was so painful
My arms started to tingle and go numb
The floor felt cold and wet
It hurt
I felt hot, nauseas, and dizzy.

*Bodily sensations refer the client's physical experiences DO NOT include sights, sounds or smells)

(5) Sensory Details: Noise, Smells, Tastes

(5N) Noises (other than human verbalizations such as spoken words, laughter, or yelling)

EXAMPLE: I heard a dog bark

His footsteps pounded

(5S) Smells (Not important that we know what it smelled like—code as 5S even if the client simply says that it smelled bad.)

EXAMPLE: I noticed a distinct smell, but have never smelled it again

He smelled like cologne and beer

(5T) Tastes (Not important that we know what it tasted like)

EXAMPLE: It tasted awful.

I could taste his sweat

OTHER GENERAL CODING TIPS

- When inconsistencies are detected within the same written account, this is counted towards the participant's total factual inconsistency score. The consistency of future accounts will be compared to the detail that was mentioned last. The latter detail will be used for comparison to the previous and subsequent account for consistency.

- *There are some cases in which a clause could provide details about more than one category, and should be coded as such. (*However, be careful not to double count the clause when counting the total number of clauses in the account!*)
 - Sometimes, a client may describe multiple instances of abuse in the same account. Code details from both events.
-

Narrative Number:

Date Coded:

Coder:

Total Clauses:

Number of clauses before the onset of threat:

(0) Nontrauma:

(1) Context:

(2) Perpetrator/Victim Characteristics:

2a (perp):

2b (victim):

2c (relationship):

(3) Assault characteristics:

(4) Peritraumatic reaction

4a (thoughts):

4b (behaviors):

4c (emotions):

4e (bodily sensations):

(5) Sensory Details

5N (Noises):

5S (Smells):

5T (Taste):

(1) CONTEXT

TIME OF ASSAULT

Date: __/__/____ *Instructions: do not code any unknown parts of the date*

Season: 0-none 1-Spring 2-Summer 3-Fall 4-Winter

Time: (HH:MM) __:__ am/pm (circle one)

Time of day: 0-none 1-Morning 2-Afternoon 3-Night 4-Other

Duration of Assault: _____ *Instructions: convert to minutes; if client provides a range compute average (e.g., 30-40 minutes would be coded as 35 minutes); do not code descriptors such as "it seemed to last forever", code time even if client expresses uncertainty (e.g., "maybe it was 10 minutes" would be coded as 10 minutes) unless they provide a more certain alternative (e.g., "it felt like 10 minutes but I know it was at least 20 minutes" would be coded as 20)*

LOCATION OF THE EVENT

Instructions: Although the client may mention several locations in the same account, only locations where an assault took place should be coded. Code all that apply.

- | | | |
|---|---|-----------------------|
| 0 | 1 | Home/apartment |
| 0 | 1 | Car/Truck/Van |
| 0 | 1 | Other vehicle, |
| 0 | 1 | Park |
| 0 | 1 | Hotel |
| 0 | 1 | Other (specify) _____ |

(2) PERPETRATOR/VICTIM CHARACTERISTICS

VICTIM Characteristics

Evaluations of the perpetrator's appearance are not coded (e.g., She looked scary, he looked enormous)

Age: (Years and Months) ____ *If range is given, code mean. (code zeros if not mentioned)*

- 0 No mention of age
- 1 Child/Adolescent victim
- 2 Adult victim

0 1 Name
 0 1 -Facial Features: specify _____

0 1 _Hair: _____

0 1 _Weight: _____ *Convert to pounds. If range is given, compute average.*

0 1 -Height: _____ *Convert to inches. If range is given, compute average.*

0 1 _Clothing: _____

0 1 _Other: _____

PERPETRATOR(S) Characteristics

(Code for each perpetrator described)

Gender: Number of **female** perps mentioned: ____

Number of **male** perps mentioned: ____

Race: 0-none 1-White (x____) 2-Black (x____) 3-Asian (x____) 4-Hispanic/Latino/a (x____) 5-Other (x____)

Age: (Years and Months) ____ (code zero if not mentioned)

0 1 Name
 0 1 Facial Features: specify _____

0 1 Hair: _____

0 1 Weight: _____ *convert to pounds. If range is given, compute average.*

0 1 Height: _____ *convert to inches. If range is given, compute average.*

0 1 Clothing: _____
0 1 Other: _____

VICTIMS RELATIONSHIP TO PERPETRATOR

0 1 Stranger
0 1 Acquaintance
0 1 Date
0 1 Co-worker
0 1 Friend
0 1 Ex-spouse/ex-romantic partner
0 1 Partner/Spouse
0 1 Relative (specify) _____
0 1 Other (specify) _____

THREATS MADE BY PERPETRATOR:

0 1 Threats towards victim (*specify*):

0 1 Threats towards victim's loved ones (*specify*):

0 1 Other threat (*specify*):

ALCOHOL/DRUGS USED

Instructions: Code as a 1 if under the influence of alcohol or other substances.

0 1 Perpetrator(s): Substance(s): _____ Amount: _____
0 1 Victim: Substance(s): _____ Amount: _____

IF YES:

0 1 Victim unwillingly consumed drugs *Instructions: Code as a 1 if the victim used drugs under threat, was unknowingly drugged, etc.*

(3) ASSAULT CHARACTERISTICS

0 1 Series of incidents?

TYPE OF TRAUMA PERPETRATED

Physical Trauma

Instructions: Code all that apply.

- (0) Not mentioned
- (1) Injury incurred, location of injury is unclear
- (2) injury to head/face/neck
- (3) injury to other area of body

- 0 1 2 3 Hit (also “smacked”, “punched”)
- 0 1 2 3 Kicked
- 0 1 2 3 Restrained
- 0 1 2 3 Choked
- 0 1 2 3 Stabbed
- 0 1 2 3 Cut
- 0 1 2 3 Shot
- 0 1 2 3 Held underwater
- 0 1 2 3 Bludgeoned (w/ object)
- 0 1 2 3 Pushed
- 0 1 2 3 Hair pulled
- 0 1 2 3 Other _____

Sexual Trauma

Instructions: Assume vaginal intercourse if client uses the terms such as “rape”, “sex”, or “intercourse” without further specifying. Code all that apply.

- 0 1 Vaginal intercourse
- 0 1 Anal intercourse
- 0 1 Assailant performed oral sex on victim
- 0 1 Victim was forced to perform oral sex
- 0 1 Assailant put objects inside of victim
- 0 1 Kissing and/or fondling (of body parts other than genitalia)
- 0 1 Manual stimulation of assailant
- 0 1 Manual stimulation of victim
- 0 1 Other: (describe) _____

NUMBER OF PEOPLE WITNESSING VICTIMIZATION AND RELATIONSHIP TO VICTIM

Instructions: Do not include victim and perpetrator. Witness must observe some portion of the actual assault. Merely being present in another room in the home during the assault, for example, does not satisfy this criteria: _____

WEAPONS

Instructions: Weapon does not need to be actively used, but must be present at the time of assault. (1 = weapon used by assailant, 2 = weapon used by victim)

- 0 1 2 Gun
- 0 1 2 Knife
- 0 1 2 Other sharp object
- 0 1 2 Other Blunt Instrument
- 0 1 2 Other _____

INJURIES/CONSEQUENCE INCURRED

Instructions: Injuries must be clearly stated (e.g., he broke my nose with a punch), NOT just implied (e.g., he hit me hard in the face).

- 0 1 Bruises to head/face/neck
- 0 1 Bruises to rest of the body
- 0 1 Broken bones in head/face/neck
- 0 1 Broken bones in rest of body
- 0 1 Dislocated Bones to head/face/neck
- 0 1 Dislocated bones other than head/face/neck
- 0 1 Cuts to head/face/neck
- 0 1 Cuts to rest of body
- 0 1 Loss of consciousness
- 0 1 Damaged teeth
- 0 1 Ruptured eardrum
- 0 1 Burns to head/face/neck
- 0 1 Burn to rest of body
- 0 1 Miscarriage
- 0 1 Sexually Transmitted Disease
- 0 1 Damage to Internal Organs
- 0 1 Continued Medical Complications Specify: _____
- 0 1 Pregnancy
- 0 1 Other _____

(4) PERITRAUMA

REACTIONS

Instructions: Do not code if participant wishes that she would have reacted a certain way in hindsight, wonders why she didn't respond in one way, or tried to respond in one way but could not (e.g., tried to scream but no sound came out). Code all that apply.

- 0 1 Tried to reason
- 0 1 Screamed
- 0 1 Cried
- 0 1 Begged/Pleaded
- 0 1 Kicked/Hit/Punched
- 0 1 Kept quiet/motionless
- 0 1 Used a weapon
- 0 1 Passed out
- 0 1 Tried to struggle free
- 0 1 Did as was told
- 0 1 Threatened
- 0 1 Bit/Scratched
- 0 1 Other _____
- 0 1 Concern about being killed: _____
- 0 1 Concern about being injured: _____

EMOTIONS DURING TRAUMA

Instructions: emotion must be listed verbatim, not implied. Variations of the word are acceptable. (i.e., "it was embarrassing" counts for embarrassment)

- 0 1 Afraid
- 0 1 Afraid of going crazy/losing control
- 0 1 Angry
- 0 1 Anxious
- 0 1 Ashamed
- 0 1 Betrayed
- 0 1 Calm
- 0 1 Confused
- 0 1 Detached
- 0 1 Disgusted
- 0 1 Embarrassed
- 0 1 Fearful
- 0 1 Guilty
- 0 1 Helpless
- 0 1 Humiliated
- 0 1 Hurt
- 0 1 Like it wasn't happening
- 0 1 Numb
- 0 1 Relieved
- 0 1 Repulsed
- 0 1 Sad
- 0 1 Scared
- 0 1 Shocked/Surprised
- 0 1 Terrified
- 0 1 Violation of trust
- 0 1 Worried

0 1 Other _____

0 1 Client describes experiencing physical pain

MEMORY CONFIDENCE

Tally the number of times the participant makes mention of difficulty remembering some facts or uncertainly about facts (*e.g., not sure what happened next, unclear, I can't remember how I got from the house to the hospital, this part gets hazy, etc.*). Must pertain specifically to facts about the event. Factual detail in the form of a question SHOULD be coded (*e.g., Was he wearing a red shirt?*) Conceptual comments (*e.g., I can't figure out why he raped me*), or comments that indicate the absence of an event (*e.g., I don't remember what I ever did to him to make him upset*) SHOULD NOT be coded. Comments that indicate avoidance (*e.g., it is hard to write about this part, I can't think about this, I don't want to remember*) should not be counted:

Memory Difficulty Tally: _____

Tally the number of times the participant makes mention of memory certainty (*e.g., certain, sure, positive, know for a fact, no doubt in my mind, etc.*) about factual detail of the event. Conceptual comments (*e.g., I am sure he is evil, I am certain he will do it again*) should not be coded:

Memory Clarity Tally: _____

Number of factual inconsistencies within this trauma account (*e.g., the client first said that the assault occurred in June and later mentioned that the assault occurred in January*) _____