Are memories for sexually traumatic events “special”? A within-subjects investigation of trauma and memory in a clinical sample

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According to a long-standing clinical tradition, sexually traumatic experiences are processed and recalled differently from other experiences, often leading to memory impairment. In this study, we compared the characteristics of traumatic memories for sexual violence and two other types of emotional experiences. 

N = 44 women recruited from a local sexual trauma agency were asked to recall and describe three autobiographical events: sexual abuse/assault, a non-sexual trauma, and a positive emotional event. The characteristics of the three memory types were compared on both subjective and objective measures. Further, the potential influences of level of traumatic impact and dissociation were assessed. Results indicated that memories for sexual trauma were not impaired or fragmented relative to other memories. Instead, memories for sexual trauma were associated with a remarkably high level of vividness, detail, and sensory components. Further, high levels of traumatic impact were not associated with memory impairment. Implications for the ongoing traumatic memory debate are discussed.

Although the relation between trauma and memory has been the focus of psychological research for many years, there still is little consensus concerning how traumatic events are processed and recalled (e.g., McNally, 2003). A range of perspectives have been applied to understanding the impact of trauma on memory, from the traditional clinical argument that trauma impairs memory for the event (e.g., Brewin, 2001; Hyman & Byrne, 1999; Nadel & Jacobs, 1998; van der Kolk & Fisler, 1995) to the increasingly supported scientific view that memory is facilitated by trauma (e.g., Berntsen, 2001; Porter & Peace, in press). For example, Porter and Peace (in press) asked participants to recall a recent traumatic experience and a positive emotional experience in interviews separated by 3 months (see Peace & Porter, 2004) and again after 3.45 to 5 years. Traumatic experiences were more enduring over time than positive experiences, both in terms of vividness and factual consistency.

Studies of extreme trauma, such as the experience of a concentration camp in World War II, also suggest that traumatic memories can be...
remarkably enduring (e.g., Merckelbach, Dekkers, Wessel, & Roefs, 2003; Schelach & Nachson, 2001; Wagenaar & Groeneweg, 1990). Recent research examining traumatic experiences in Croatian war veterans suffering from PTSD demonstrated that memory for trauma remained stable over time and was recalled similarly to neutral events (Geraerts et al., 2007). Collectively, these studies indicate that recollections of trauma typically are not impaired relative to other emotional and non-emotional events. Perhaps a more contentious remaining issue is whether specific types of traumas may lead to impairment. In particular, sexual trauma often is viewed as having a unique impact on memory, generally such that it is recalled more poorly than other traumatic experiences (e.g., Koss, Figueredo, Bell, Tharan, & Tromp, 1996) due to dissociation or repression. The goals of the present study were to examine: (1) the characteristics of memories of sexual victimisation relative to other traumatic and non-traumatic events; (2) the impact of level of trauma on memory quality; and (3) the possible association of alexithymia and dissociation with memory impairment.

**IS SEXUAL TRAUMA UNIQUE?**

Relative to other traumatic experiences, sexual assault in adulthood is associated with one of the highest rates of post-traumatic stress disorder (PTSD), while child sexual abuse (CSA) is associated with more varied reactions (e.g., Foa & Rothbaum, 1998; Hanson et al., 2001, Rind, Tromovitch, & Bauserman, 1998; Schiraldi, 2000). On the surface, some studies are consistent with the notion that sexual trauma is associated with incomplete memories. For example, Williams (1994) reported that approximately 38% of women with documented cases of CSA failed to recall these specific incidents in adulthood. Interpretations of this finding are varied, including that the women simply chose not to acknowledge and discuss the events with the researcher (see Ofshe & Watters, 1994).

Koss and colleagues found that rape memories (and traumatic memories in general) subjectively were less vivid, less coherent, less detailed, more poorly remembered, and generally avoided in thought and discussion (e.g., Koss et al., 1996; Koss, Figueredo, Bell, Tharan, & Tromp, 1999; Tromp, Koss, Figueredo, & Tharan, 1995) relative to memories for other types of emotional events. However, this research involved a mail-out survey and respondents were simply asked to respond to questions about qualities of their memories for a rape, an “unpleasant”, or a “pleasant” experience, but were not asked to provide a narrative description of the events. Griesel, Cooper, Hernandez, and Yuille (2005) examined memories of sexual trauma and positive experiences in sex-trade workers. Their findings revealed that sexual assaults and positive events showed similar patterns of memory characteristics in both the quantity and quality of details. Thus, memory for sexual trauma did not appear to be impaired, but neither did it appear to be dissimilar from other types of emotional events. Porter and Birt (2001) reported that in comparison to memories for non-sexual traumatic experiences, memories for sexual trauma were associated with higher levels of vividness and clarity, had more sensory components, and were rated as having a higher overall quality. On the other hand, Berliner, Hyman, Thomas, and Fitzgerald (2003) found that memories for sexual (relative to non-sexual) traumas among children were less vivid, less coherent, and contained less sensory detail. The researchers suggested that the repeated nature of sexually abusive experiences might have affected recall for particular episodes. Nonetheless, based on their overall findings, the authors observed that “trauma memories (both sexual and non-sexual) and memories for positive events are more similar than not” (p. 235). Other work suggests that CSA memories can remain detailed and reliable over long periods. For example, Alexander et al. (2005) found that memories for documented CSA were generally highly detailed and enduring, even over extended intervals (e.g., 12 to 21 years). Thus, while some research supports that sexual trauma may lead to impaired memory functioning, other studies find no evidence for memory impairment relative to other experiences.

**THE INFLUENCE OF LEVEL OF TRAUMATIC IMPACT**

Another controversy in the area of trauma and memory concerns whether the degree of trauma influences memory quality. For example, clinical levels of PTSD have been linked to autobiographical memory impairments (Brewin, 2001; Halligan, Michael, Clark, & Ehlers, 2003). The extent to which the event is re-experienced in memory through vivid flashbacks and intrusions
of the event, as well as subsequent attempts to avoid recall, may lead to difficulties in intentional recall about the traumatic episodes (e.g., Byrne, Hyman, & Scott, 2001; Tromp et al., 1995). As such, some have argued that extreme traumatic memories lack integration in consciousness and do not contain a coherent narrative, instead being experienced mainly as sensory and emotional fragments (Brewin, Dalgleish, & Joseph, 1996). However, these effects may not be maintained over time, as traumatic impact tends to subside independently over time and/or with treatment for PSTD. Accordingly, a reduction in trauma symptomatology has been associated with improved memory for the event.

Foa, Molnar, and Cashman (1995) studied memories for rape experiences both before and after exposure therapy. They found that memories were more coherent and less fragmented after therapy, suggesting that higher levels of traumatic stress impaired recall but that these deficits are not permanent. While some studies have linked traumatic stress to memory dysfunction (e.g., Tromp et al., 1995), other empirical evidence suggests that clinical levels of stress are associated with a different (but not impaired) pattern of recollection (e.g., Geraerts et al., 2007; Roemer, Litz, Orsillo, Ehlich, & Friedman, 1998; Rubin, Feldman, & Beckham, 2004; see also McNally, 2003). For example, Berntsen, Willert, and Rubin (2003) evaluated traumatic memories associated with PTSD versus those that were not linked to PTSD. Overall, memories recalled by the PTSD group were no more fragmented than the non-PTSD group. Higher levels of traumatic impact were associated with a higher degree of vividness, detail, emotion, and sensory information (Berntsen et al., 2003). In their sample, Porter and Birt (2001) evaluated memory characteristics as a function of trauma severity and found that severe traumatic events were associated with greater vividness and clarity in memory as compared to traumatic events with lower stress levels (also see Alexander et al., 2005).

THE ROLE OF ALEXITHYMIA AND DISSOCIATION IN TRAUMATIC REMEMBERING

It is possible that individual pathological responses to sexual trauma may be associated with emotional processing deficits that impair subsequent recollections. Alexithymia refers to a condition in which an individual continually has difficulty in recognising and describing their emotional experiences (Kenny, 1998; Lumley, Gustavson, Partridge, & Labouvie-Vief, 2005), and difficulty discriminating between emotional states and bodily sensations (Taylor, 1984). Taylor, Bagby, and Parker (1997) reported that alexithymic individuals may have difficulty in associating feelings with memories, which could lead to impaired recollections. Several studies have reported an elevated rate of alexithymia in individuals who have experienced CSA (e.g., Hund & Espelage, 2005; Mazzeo & Espelage, 2002; Scher & Twain, 1999). Deficits in the recognition and generation of emotional expressions (Camras et al., 1988) and the ability to label one’s own feelings (Berenbaum, 1996) are prominent in sexually abused populations relative to non-sexually abused controls.

According to the clinical literature, dissociation may also be a common response to traumatic experiences (e.g., Banyard, Williams, & Siegel, 2001; Morgan et al., 2001) and may interfere with memory integration and elaboration (Ehlers & Clark, 2000; Harvey & Bryant, 1999; Murray, Ehlers, & Mayou, 2002). Kisiel and Lyons (2001) evaluated dissociative tendencies in a sample of 114 children and adolescents with known histories of abuse (sexual, physical) and neglect. They found that sexual abuse was associated with the highest levels of dissociation relative to other abuse groups and non-abuse controls. It is possible that the lack of psychological integration characteristic of dissociation would result in disintegrated memories. For example, some researchers argue that with increased levels of dissociation, elements of traumatic events may only be partially encoded (e.g., shallow processing), especially when “disconnected” from the event (Berlin et al., 2003). Other research, however, has failed to find a relationship between traumatic events and dissociative amnesia (e.g., Geraerts et al., 2007).

Both alexithymic and dissociative tendencies appear to be related to susceptibility to memory distortion (e.g., Candel, Merckelbach, & Kuijpers, 2003; Porter, Birt, Yuille, & Lehman, 2000; Zoellner, Foa, Brigidi, & Przeworski, 2000). In light of this, it would be expected that memory quality, vividness, coherence, and relevance would be negatively related to higher levels of these factors. However, some studies have found no relation between dissociation and traumatic memory deficits (Berlin et al., 2003). No research has
yet compared the roles of alexithymia and dissociation in memory for sexually and non-sexually traumatic experiences.

THE CURRENT STUDY

The current study was intended to provide a comprehensive within-subjects investigation of memory for sexual trauma, non-sexual trauma, and positive emotional events in a clinical sample. We predicted, contrary to the brief survey findings of Koss et al. (1996), that narratives concerning sexual victimisation would not evidence impairment relative to other types of emotional experiences. Rather, we hypothesised that the recollection of sexually traumatic events may be enhanced relative to other emotional experiences. However, this predicted pattern could be mediated by the age at the time of the traumatic experience, level of traumatic stress, alexithymia, and dissociation.

METHOD

Participants

The sample was 44 adult females who had been referred for counselling at a sexual assault centre or psychological agency in eastern Canada. All referred clients had a documented history of sexual victimisation. Participants responded to advertisements for a memory study about emotional events (sexual trauma, non-sexual trauma, positive event) that were posted at the agency offices. The mean age of the participants was 30.1 years ($SD = 8.9$; range 18–52).

Measures

Written narratives. Participants were provided with a questionnaire inquiring about a sexually traumatic experience, a non-sexually traumatic experience, and a positive emotional experience. Participants were asked to select traumatic and positive events in the same general age range (e.g., childhood, adolescence, adulthood) as the sexually traumatic experience. For each event type (counterbalanced), participants were asked to choose a specific event (rather than a series of events) and write out everything they could remember about the incident in as much detail as possible. They were also instructed not to go back in the questionnaire after they had completed a particular section.

All women in the sample reported either an incident of CSA (43.2%) or an adult sexual assault (56.8%). The reported non-sexual traumas were: death of a loved one (27.3%), criminal victimisation (22.7%), accident/injury (20.5%), relationship related (9.1%), medical condition (9.1%), or other (6.8%). Two women did not provide the non-sexual trauma description. The positive events included: relationship related (25%), celebration/graduation (22.7%), other (22.7%), unexpected gift (13.6%), or vacation (9.1%). Three women did not provide the positive event description.

Impact of Event Scale (IES). The IES (Horowitz, Wilner, & Alvarez, 1979) is a 15-item self-report questionnaire involves rating the frequency of various cognitive experiences in relation to a traumatic event (e.g., I tried not to think about it; any reminder brought back feelings about it) on a scale marked 0 (not at all), 1 (rarely), 3 (sometimes), and 5 (often). The IES contains two subscales measuring intrusion in daily life, and avoidance of memories and stimuli associated with the event. A total score is generated by combining the subscale scores, and provides an assessment of the overall level of impact of an event. This scale was administered with respect to sexual trauma (Cronbach’s $\alpha = .91$), non-sexual trauma (Cronbach’s $\alpha = .89$), and positive events (Cronbach’s $\alpha = .84$). This scale has been extensively used with trauma victims (Foa & Rothbaum, 1998; Peace & Porter, 2004), and is a reliable measure of post-traumatic impact (e.g., Briere, 1997; Carlson, 1997).

Memory Assessment Procedure (MAP). The MAP (Porter, Yuille, & Lehman, 1999) was used as an assessment tool to examine the qualitative aspects of memory reports (e.g., see Porter & Birt, 2001). This procedure evaluates a variety of presentation-specific characteristics, such as coherence, amount of detail, and emotional components, rated by coders. An inter-rater reliability check was conducted by having a second rater (naive to the hypothesis of the study and trained on MAP criteria) recode 20% of the memories elicited in the study. The coding had high inter-rater reliability for each of sexual trauma, non-sexual trauma, and positive

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1 All events were classified as child (0–13) or adult (14+) based on the legal age of consent to sexual activity in Canada.
experiences, with all correlations ranging from .86 to .97 (all ps < .001) and no significant mean differences on any variables (ps > .05).

The MAP also measures phenomenological (completed by participant) characteristics of memory, as completed in the Emotional Memory Survey (EMS). The EMS required the completion of 15 items pertaining to the participant's view of her memory features. The EMS uses a 7-point Likert scale on some questions (e.g., indicate how often you have thought about the event; indicate how vivid your memory is for the event), and YES/NO responses on others (e.g., was there ever a period of time where you could not remember the event?). This survey also asked participants to indicate sensory and emotional experiences associated with the event.

20-Item Toronto Alexithymia Scale (TAS-20). The TAS-20 (Cronbach's α = .85; Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994) was used to examine the extent to which participants have deficits in processing and regulating emotions, including the ability to identify one’s own emotions. This is a 20-item self-report questionnaire that describes a range of statements concerning emotions. Participants rate how similar the statement is to their own experiences, on a scale from 1 (strongly disagree) to 5 (strongly agree).

Dissociative Experiences Scale (DES). The DES (Cronbach's α = .95; Bernstein & Putnam, 1986) is a 28-item self-administered questionnaire that describes a range of common dissociative experiences (e.g., being unaware of other events when absorbed in watching a movie) to severe indications of dissociation (e.g., not recognising family members and friends). Participants rated how often the experiences described happen to them (in terms of a percentage from 0% to 100%; increments of 10%). A single score is calculated, with higher scores being related to higher degrees of dissociative tendencies. The DES has been demonstrated to show good reliability, internal consistency, and construct validity in this regard (Carlson & Putnam, 1993).

Research design

This study had a mixed multivariate design with memory type (sexual trauma, non-sexual trauma, positive) as the main within-subjects variable and event age category as the between-subjects factor within each memory type. Counterbalancing was entered into each statistical analysis and no significant order effects were found (all ps > .05).

Procedure

After reviewing the posted ad, potential participants informed their counsellor of their interest in participating. After reviewing and signing the informed consent form, participants received a Memory Survey Booklet consisting of several memory report forms and questionnaires. Instructions were given verbally and in writing to each participant, to complete the entire packet within a week of receipt, preferably in a single sitting. Due to the sensitive nature of the experiences being recalled, participants completed the packets on their own time, similar to previous studies using a mail survey format (e.g., Koss et al., 1996).

A Written Narrative Memory Report form was included for each type of event, with the order of presentation counterbalanced in each survey package. Participants provided a written description of a sexually traumatic memory (STM), a non-sexually traumatic memory (NSTM), and a positive emotional memory (PM). The written instructions have been used in previous research on traumatic memories (Peace & Porter, 2004; Porter & Birt, 2001), and were slightly modified for each memory type here. After providing each narrative, participants answered questions on the IES and EMS regarding a particular event. After describing the STM, NSTM, and PM, the TAS-20 and DES were administered.

RESULTS

Emotional memory characteristics

To investigate possible differences in memory characteristics as a function of event type, a repeated measures MANOVA was conducted. Memory type was the within-subjects independent variable and subjective memory characteristics (EMS) were the dependent measures. This analysis revealed an overall effect of memory

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2 Subjective characteristics included anxiety/stress, degree of intoxication, talking/thinking about event, memory vividness and quality, sensory components, turning off emotions, becoming emotional, detachment, and emotional intensity.
type, $F(22, 136) = 8.23, p < .001$. Follow-up ANOVAs indicated differences on several self-reported memory characteristics including vividness of memory, $F(2, 78) = 7.41, p < .001$, sensory components, $F(2, 78) = 10.96, p < .001$, and emotional intensity, $F(2, 78) = 22.85, p < .001$ (see Table 1). For each of these features, sexually traumatic events were rated higher than the other memory types.

Participants also were asked to rate (for each memory type) whether there was “ever a period of time when you did not remember the event even if you had tried” (repression). Overall, 9 (20.5%) sexual traumas were associated with claims of repression relative to 2 (4.8%) of non-sexual traumas and 0 positive experiences. A non-parametric analysis was used to rank order responses, and revealed that self-reports of repression were significantly different, Kendall’s $\chi^2 = 13.40, p < .01$. Self-reported attempts to “forget” the event ranged from 43.2% for sexual traumas, 11.9% for non-sexual traumas, to 2.4% for positive events. Self-reported “forgetting” of sexual trauma was significantly higher than both non-sexual and positive event ratings, Kendall’s $\chi^2 = 22.57, p < .001$.

An additional MANOVA was conducted using for the MAP criteria as the dependent variables across the memory types (see Table 1). The MANOVA revealed a significant main effect of memory type, $F(16, 24) = 2.86, p < .01$. Sexually traumatic experiences were associated with the greatest amount of detail, $F(2, 78) = 29.74, p < .001$, more emotional components, $F(2, 78) = 9.98, p < .001$, more time and place details, $F(2, 78) = 7.75, p \leq .001$, more reasons for lack of memory, $F(2, 78) = 10.15, p < .001$, and highest word counts, $F(2, 78) = 28.74, p < .001$ (see Table 1).

Memory characteristics as a function of age of occurrence

The specific mean age at the time of sexual trauma was 17.16 ($SD = 9.88$; range 3–51). The mean age for CSA was 8.83 ($SD = 8.46$) and 22.18 ($SD = 7.58$) for sexual assault. The mean age of occurrence for non-sexually traumatic events was 19.13 ($SD = 9.48$; range 3.5–42). Finally, positive emotional events occurred around age 20.81 ($SD = 10.29$; range 4.5–51). There is no significant difference between the mean ages for each memory type, $F(2, 74) = 2.88, p > .05$.

To address whether memory characteristics differed for CSA and adult sexual assault experiences, a MANOVA was conducted with age category as the between-subjects factor and memory characteristics as the dependent measures. The analysis revealed no overall main effect of age, $F(28, 15) = 1.21, p > .05$. However, univariate analyses revealed that CSA was associated with more claims of repression, $F(1, 42) = 10.22, p < .01$, and less coherent memory reports, $F(1, 42) = 5.34, p < .05$. A similar analysis was used for age comparisons within non-sexually traumatic experiences, and an effect of age approached significance, $F(28, 13) = 2.16, p = .07$. Specifically, childhood traumas were less vivid, $F(1, 40) = 4.05, p = .05$, and associated with periods of forgetting, $F(1, 40) = 14.82, p < .001$; associated with more claims of repression, $F(1, 40) = 4.44, p < .05$; with memory problems, $F(1, 40) = 14.82, p < .001$; and providing reasons for lack of memory, $F(1, 40) = 4.44, p < .05$. A multivariate analysis of differences across age ranges for positive memories also approached significance, $F(27, 12) = 2.45, p = .06$. Follow-up analyses indicated that positive childhood experiences were rated as lower in: emotional intensity, $F(1, 38) = 4.46, p < .05$, levels of becoming emotional, $F(1, 38) = 5.84, p < .05$, coherence, $F(1, 38) = 5.89, p < .05$, and degree of intoxication, $F(1, 38) = 4.31, p < .05$, relative to positive adult experiences. In addition, positive events in childhood contained more emotional details about other people relative to narratives of positive adult experiences, $F(1, 38) = 7.12, p < .05$.

Psychological impact and remembering

The mean IES scores for each event type was: STM 55.66 ($SD = 14.26$), NSTM 41.55 ($SD = 14.10$), and PM 19.46 ($SD = 9.44$). Sexual traumas were also associated with the highest levels of intrusion ($M = 26.77, SD = 7.24$) and avoidance ($M = 28.89, SD = 8.02$), relative to non-sexual traumas ($M = 21.93, SD = 7.67$ and $M = 19.62, SD = 7.40$, respectively) and positive experiences ($M = 15.15, SD = 7.14$, and $M = 4.32, SD = 3.92$). A repeated measures MANOVA was conducted on levels of traumatic stress as a function of

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3 Objective characteristics included amount of detail, time and place details, emotional components, relevance, coherence, reasons for lack of memory, and word count.
memory type, and significant mean differences were revealed. Sexual traumas contained the highest mean total IES rating relative to non-sexual traumas and positive experiences, $F(2, 78) = 138.47$, $p < .0001$. Pairwise comparisons indicated that non-sexual and positive experiences also differed on the total level of impact of the event, $t(39) = 9.19$, $p < .0001$. Sexual traumas were also associated with the highest mean level of intrusive, $F(2, 78) = 49.10$, $p < .0001$, and avoidant symptomatology, $F(2, 78) = 199.61$, $p < .0001$. Follow-up analyses indicated that non-sexual traumas and positive experiences differed significantly on their mean level of intrusion $t(39) = 4.9$, $p < .0001$, and avoidance, $t(39) = 11.98$, $p < .0001$.

Correlational analyses also were conducted to assess the association between level of impact and memory characteristics (see Table 2). More severe sexual traumas were associated with becoming more emotional and experiencing negative emotions when discussing the event. Higher IES scores were also associated with higher levels of alexithymia, $r(44) = .51$, $p < .001$. There were no associations between level of impact and dissociation or alexithymia for either non-sexual traumas or positive events. For non-sexual traumas, higher IES total scores were associated with more thoughts, vividness, and emotionality surrounding the event, but were unrelated to any objective memory characteristics. Positive events with a higher “impact” were positively correlated with more anxiety/stress and thoughts about the event.

### The role of alexithymia and dissociation

The mean alexithymia score (TAS) was 56.27 ($SD = 12.26$; range 26–80) and the mean DES score was 20.22 ($SD = 10.99$; range 5–50). There was a positive association between levels of dissociation and alexithymia, $r(44) = .62$, $p < .001$, suggesting that these two constructs have overlapping features in victimised populations. Both variables were correlated with a number of self-reported and objective features of both traumatic and non-traumatic events (see Table 2 for

### Table 1
Subjective and objective memory characteristics

<table>
<thead>
<tr>
<th>Memory characteristics</th>
<th>STM</th>
<th>NSTM</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subjective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety/stress***</td>
<td>6.48(0.85)</td>
<td>5.90(1.22),c</td>
<td>4.08(1.99),c</td>
</tr>
<tr>
<td>Degree of intoxication</td>
<td>1.85(1.67),a</td>
<td>1.40(1.10),c</td>
<td>1.75(1.24),c</td>
</tr>
<tr>
<td>Talked about event***</td>
<td>3.7(1.68),a</td>
<td>5.05(1.54),b</td>
<td>5.20(1.32),b</td>
</tr>
<tr>
<td>Thought about event</td>
<td>6.08(1.19),a</td>
<td>5.75(1.10),b</td>
<td>5.48(1.24),a</td>
</tr>
<tr>
<td>Vividness of memory***</td>
<td>6.25(1.13),a</td>
<td>5.45(1.30),b</td>
<td>5.20(1.14),b</td>
</tr>
<tr>
<td>Quality of memory</td>
<td>5.45(1.47),a</td>
<td>5.18(1.45)</td>
<td>5.08(1.21)</td>
</tr>
<tr>
<td>Sensory components***</td>
<td>3.38(0.93),a</td>
<td>2.45(0.78),b</td>
<td>2.55(1.08)</td>
</tr>
<tr>
<td>“Turned off” emotions***</td>
<td>5.28(1.55),a</td>
<td>3.95(1.50),b</td>
<td>2.03(1.12)</td>
</tr>
<tr>
<td>Becoming emotional***</td>
<td>6.30(0.85),a</td>
<td>5.43(1.38),b</td>
<td>4.53(1.45)</td>
</tr>
<tr>
<td>Detachment***</td>
<td>5.10(1.48),a</td>
<td>3.70(1.76)</td>
<td>1.55(0.99)</td>
</tr>
<tr>
<td>Emotional intensity***</td>
<td>6.68(0.53),a</td>
<td>6.03(1.00)</td>
<td>5.45(0.99)</td>
</tr>
<tr>
<td><strong>Objective</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of detail***</td>
<td>316.68(238.68),a</td>
<td>159.10(75.81),b</td>
<td>103.98(51.81),c</td>
</tr>
<tr>
<td>Emotional details(self)***</td>
<td>4.58(5.62),a</td>
<td>1.90(1.98),c</td>
<td>1.50(1.81),c</td>
</tr>
<tr>
<td>Emotional details(others)***</td>
<td>1.03(1.58),a</td>
<td>0.83(1.28),b,b</td>
<td>0.50(1.45),b,b</td>
</tr>
<tr>
<td>Time and place details***</td>
<td>13.58(11.79),a</td>
<td>9.18(7.32),b,b</td>
<td>6.53(5.87),b,b</td>
</tr>
<tr>
<td>Relevance</td>
<td>5.85(1.05),a</td>
<td>6.05(0.96),b</td>
<td>5.73(0.99),b</td>
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<tr>
<td>Coherence</td>
<td>5.93(1.12),a,b,c</td>
<td>6.13(0.88),b,b</td>
<td>5.73(1.01),b,c</td>
</tr>
<tr>
<td>Lack of memory***</td>
<td>0.35(0.53),a</td>
<td>0.05(0.22)</td>
<td>0.03(0.13)</td>
</tr>
<tr>
<td>Word Count***</td>
<td>591.63(453.04),a</td>
<td>291.05(138.56),b</td>
<td>194.75(101.05),c</td>
</tr>
</tbody>
</table>

Means (and standard deviations) for subjective (EMS) and objective (MAP) memory characteristics for sexual (STM) and non-sexual (NSTM) trauma and positive (PM) experiences. Means in the same row that do not share subscripts differ at a minimum of $p < .05$ in the Fisher LSD comparison.

*p < .05. **p < .01. ***p < .001.

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4 The Bonferroni correction was applied to this correlational analysis. To avoid spurious results, the corrected alpha level was set at $\alpha = .002$. 
correlations). Notably, both DES and TAS-20 scores were associated with characteristics of sexually traumatic experiences more so than with non-sexual traumatic or positive events. Dissociation was related to emotional deficits, claims of repression, memory problems, and a lower quality of memory. However, levels of alexithymia were most strongly associated with levels of stress and emotional separation (e.g., “turned off” emotions, detachment). In addition, higher levels of alexithymia were related to a younger age at which the experience occurred (i.e., childhood) for positive memories only.

**DISCUSSION**

While clinical and scientific interest in memory for trauma is enormous (e.g., McNally, 2003), important issues remain unresolved. In particular, there is a long-standing notion that memory for trauma—in particular, sexual trauma—is typically impaired or unreliable. There are two very different lines of thought hypothesising that traumatic memories may not persist over time. The first emphasises that trauma actively impairs memories leading to fractured recollections. According to Spiegel (1997), traumatic events are unlike other types of events in that they are resistant to retrieval in memory. The second argues that traumatic memories simply are not unique relative to other memories and show a natural deterioration over time, not because of the trauma but because of ordinary forgetting and a host of suggestive influences or misinformation (for a review see Laney & Loftus, 2005). However, recent studies suggest that trauma generally is not associated with impairment or ordinary forgetting, and rather may even facilitate the qualities and reliability of memory (e.g., Porter & Peace, in press).

Our findings partially supported our hypothesis that memories for sexual victimisation would not be impaired relative to other types of emotional experiences. Memories for sexual trauma contained the greatest amount of detail, more emotional components, a higher degree of vividness, and more sensory information. Thus, both subjectively and objectively, the sexual memories had endured in quality years or decades after the events. On the other hand, sexually traumatic memories concurrently were associated with the highest rates of self-reported memory problems (43.2%) and claims of repression (20.5%), relative to nonsexual traumas (11.9% and 4.8%, respectively) and positive events (2.4% and 0%). There are several possible explanations for these findings. A simple explanation is that estimates of memory problems and repression were inflated due to semantic misinterpretations of questions. For example, participants may have reported experiencing memory problems with respect to active attempts not to remember (suppression), not consciously thinking about the event due to avoidance or detachment, or an inability to forget. Further, because of the popularity of the repression concept in society, they may have responded in a manner that they believed would be expected. In addition, all women in the sample were seeking counselling to deal with sexual victimisation, which makes them unique in several ways. A recent study by Geraerts et al. (2006) suggests that participants reporting recovered memories of CSA may overestimate their prior forgetting of the abuse. Further, it is possible that memory, repression, and fragmented recall would have been discussed in this therapeutic context, in conjunction with the use of memory techniques directed at eliciting details of the sexual trauma. Previous research has found that such techniques may lead to
inflated self-reports of memory problems relative to genuine recall abilities. For example, Read and Lindsay (2000) found that following retrieval activities targeted at improving recall of autobiographical events, participants reported higher levels of previous memory problems related to that event. Further, in most cases “memory problems” were manifested here by problems with forgetting (in terms of the intrusive memories indicated by the IES) rather than remembering. Overall, memory reports for sexual trauma were well retained and not impaired as previous research has suggested.

We also predicted that the qualities of traumatic memories would be affected by the age when the event occurred. However, there were few differences in memories for childhood versus adulthood sexual trauma. CSA was associated with less coherent memory narratives and more claims of prior forgetting (or repression) relative to adult sexual assault experiences. It is possible that CSA (especially incidents from early childhood) may have been processed or encoded less coherently in the first place. Further, CSA often involves repeated victimisations over an extended period. Although women in this sample were asked to report on their memory for a specific incident of abuse/assault, it is possible that CSA memories were less coherent because details from other abusive experiences had merged with the incident being recalled. This would tend to make the memory report appear less logical and organised, as details within a “trauma script” for abuse may not apply to all incidents. Additionally, claims of repression and memory problems were more frequent for early childhood experiences regardless of trauma type (sexual or non-sexual). Geraerts et al. (2006) found that persons reporting recovered memories of CSA (compared to a CSA group with continuous memory for the abuse and a control group) are more likely to forget prior rememberings of autobiographical events. That is, while they may believe they have forgotten an event all along, it has been recalled previously. Thus, increased reports of repression in CSA cases may be influenced not only by cultural beliefs and discussion in therapy but also by inaccurate metamemory. Additionally, frequent memory problems suggest that self-reported memory difficulties are not due to the nature of sexual trauma, but that younger children have more difficulty in recalling traumatic experiences (in general) due to phenomena such as infantile amnesia and normal forgetting (e.g., Pezdek & Taylor, 2002). Further, participants may perceive that they have memory difficulties due to the reduced availability of childhood traumas in memory relative to more recent events. For example, participants sometimes report that they have problems recalling an event when the memory does not readily come to mind or they have to engage in more extensive cognitive effort to remember (McNally, 2003; Read & Lindsay, 2000).

We also examined the relation between level of traumatic stress and memory quality. Our findings indicated that higher levels of traumatic stress were associated with enhanced recall. Sexual traumas with heightened levels of traumatic stress were associated with greater vividness, sensory components, details, and length, relative to other emotional experiences. Further, increased stress was unrelated to claims of repression or memory problems in sexual traumas. This supports previous research conclusions that traumatic impact facilitates memory (e.g., Alexander et al., 2005; Porter & Birt, 2001). Here, severe levels of impact did not impair memories for traumatic events in any way.

The final aim of this study was to evaluate the role of alexithymia and dissociation in recollections for sexually traumatic events. Results indicated that higher levels of alexithymia and dissociation were associated with pathological emotional experiences (detachment) and narrative deficiencies across all memory types. Difficulties associated with alexithymia including identifying and describing feelings have been linked to cognitive-affective deficits in assimilating the event in memory (Páez, Velasco, & González, 1999). Further, dissociation and alexithymia were most frequently associated with variations (i.e., changes in affect, less introspective memory reports) in the recall of sexual traumas. High levels of dissociation were correlated with emotional deficits, claims of repression, memory problems, and a lower quality of memory. This finding is unsurprising given the nature of dissociation and its association with detached modes of coping (e.g., Nash, Tulsey, Sexton, Harralson, & Lambert, 1993) and memory distortion (e.g., Hyman & Billings, 1998; Porter et al., 2000). Conversely, alexithymia was associated with increased stress, and a greater degree of emotional separation from the event (e.g., “turned off” feelings, detachment). These results support previously established associations between high levels of alexithymia and sexual
memories for sexual trauma were “superior” to other emotional memories regardless of the belief of participants, especially in CSA cases, that their memory was impaired. Further, we found that high levels of traumatic impact did not cause subsequent memory deficits. Individual difference factors such as dissociation and alexithymia appeared to influence self-reported assessments about memory or emotional problems, but were generally unrelated to objectively rated memory characteristics. In general, we found little evidence for the traumatic memory argument and considerable evidence that sexual trauma is remembered all too well years after the experience.

Some limitations of the current research should be noted. Like some previous studies that have supported the trauma superiority argument, participants in this study have likely spent some amount of time recalling their victimisation during therapy sessions. Similarly, Nazi concentration camp survivors and CSA victims in previous studies have recounted their victimisations in numerous legal trials (Alexander et al., 2005; Wagenaar & Groeneweg, 1990). Although the experience of recalling victimisation in therapy or on the witness stand may not be an unusual experience for victims of sexual abuse, it should be noted that the current results may not generalise to victims who are not made to recollect their trauma repeatedly. Given the nature of therapeutic interventions, differential attention is given to memories of sexual abuse, which may affect the quality of these memories relative to other traumatic or positive autobiographical events and may be reflected in the results of this study. Additionally, like most research on trauma and memory, a limitation is that we did not have access to ground truth, and focused exclusively on the self-reported narratives to assess memory qualities. As such, we can comment only on the features of the memories but not on their reliability.

**Conclusion**

Collectively, the results of the present study demonstrate that contrary to previous research, memories for sexual trauma were not impaired or fragmented. In contrast, in some ways these memories were “superior” to other emotional memories regardless of the belief of participants, especially in CSA cases, that their memory was impaired. Further, we found that high levels of traumatic impact did not cause subsequent memory deficits. Individual difference factors such as dissociation and alexithymia appeared to influence self-reported assessments about memory or emotional problems, but were generally unrelated to objectively rated memory characteristics. In general, we found little evidence for the traumatic memory argument and considerable evidence that sexual trauma is remembered all too well years after the experience.

**REFERENCES**


