

“Amnesia” for Summer Camps and High School Graduation: Memory Work Increases Reports of Prior Periods of Remembering Less¹

J. Don Read^{2,4} and D. Stephen Lindsay³ 

Claims regarding amnesia for childhood sexual abuse have often been based on studies of adults' responses to questions of the form, "Was there ever a period of time when you remembered less of the abuse than you do now?" In this experiment, 43 adult (mean age = 42) participants rated their current and prior memories of several nontraumatic childhood/adolescent events. Reports of prior periods of less memory were fairly common. Participants then engaged in "reminiscence" or "enhanced" retrieval activities directed toward remembering more about a selected target event. Following retrieval, 35% of the reminiscence condition participants reported prior poor memory for the target event, as did 70% of the enhanced condition. These results highlight the need for appropriate control conditions in retrospective studies of amnesia for childhood trauma.

KEY WORDS: childhood sexual abuse; amnesia; forgetting; trauma.

Many professionals and members of the public accept the claim that child victims of sexual abuse and other types of trauma often suffer pathological memory loss or amnesia as a direct consequence of the trauma (for critical reviews of these claims see, Garry, Loftus, & Brown, 1994; Kihlstrom, 1994; Lindsay & Read, 1994, 1995). For professionals, the primary sources of this belief have been surveys of adults identified as survivors of childhood trauma (usually sexual abuse) who have been asked to make retrospective assessments of their prior ability to remember the trauma (e.g., Briere & Conte, 1993; Elliott & Briere, 1995;

¹Benjamin E. Saunders, Associate Editor, was the action editor for this article.

²University of Lethbridge.

³University of Victoria.

⁴To whom correspondence should be addressed at Department of Psychology, University of Victoria, P.O. Box 3050, Victoria, B.C. V8W 3P5, Canada. e-mail: jdread@uvic.ca. Fax: 250-721-8929.

Feldman-Summers & Pope, 1994; Gold, Hughes, & Hohnecker, 1994; Williams, 1994; for review see Brown, Schefflin, & Hammond, 1998; Whitfield, 1997). Although the specific question asked has varied from study to study, its general form has been, "Was there ever a period of time when you *remembered less* about the event than you do now?" (see Elliott & Briere, 1995). Affirmative answers to such questions have been taken as evidence of a prior period of impaired memory or "partial amnesia" for the abuse event. Similarly, affirmative responses to a question of the form, "Was there ever a period during which you had *no memory* of this event?" have been interpreted as evidence of a prior period of "complete amnesia."

A few studies have reported prospective analyses of adults' recollections of documented childhood abuse (Widom, 1997; Williams, 1994, 1995). These studies provide the best available evidence for the claim that a nontrivial minority of adults who experienced childhood abuse later do not report such abuse. The Williams (1995) research also asked participants who did report memories of the documented abuse whether there was ever a time when they did not remember that the abuse had happened to them, to which 16% responded affirmatively.

Such findings have convinced many clinicians and researchers (e.g., Bremner, Southwick, & Charney, 1997; Brewin, 1997; Briere, 1997; Brown et al., 1998; Carlson, Armstrong, & Loewenstein, 1997) that memory impairment is a frequent outcome of trauma. Brown et al. (1998) declared that these studies have met "the true test of science" by virtue of the replication of findings of impairments in all studies and concluded that ". . . the data reported across *every* one of the 30 studies demonstrate that either partial or full abuse specific amnesia, either for single incidents of childhood sexual abuse or across multiple incidents of childhood sexual abuse is a robust finding" (p. 194, italics theirs). Descriptions of memory impairment or amnesia vary but its most frequent usage appears to accord with the DSM-IV's [American Psychiatric Association (APA), 1994, p. 477] definition of "dissociative amnesia" as "an inability to recall important personal information, usually of a traumatic or stressful nature, that is too extensive to be explained by ordinary forgetfulness." Most writers refer simply to "amnesia" (e.g., Elliott & Briere, 1995), while others use either "dissociative amnesia" or "traumatic amnesia" or both (e.g., Brown et al., 1998; van der Kolk & Fisler, 1995). These terms however, are linked by a common assessment procedure: research participants' responses to the kinds of questions described above.

Implicit in the conclusions of such studies is the assumption that retrospective reports of partial or complete amnesia for comparably memorable but nontraumatic life events would be at or near zero. Thus figures for reports of a prior period of less or no memory for traumatic events [e.g., 16% by Williams (1995), 31% by Loftus, Polonsky, & Fullilove (1994), 45% by Elliott & Briere (1995), 59% by Briere & Conte (1993), 64% by Herman & Schatzow (1987), and 77% by Roe & Schwartz (1996)] have all been described as estimates of the incidence of amnesia among abuse survivors. Despite the large and puzzling variability in these figures, the

apparent consensus of opinion regarding the memory–trauma relationship seems to have discouraged the question, “Compared to what?”

Schefflin and Brown (1996, pp. 145–146) summarized the evidence for the reality of amnesia for sexually abusive events by writing, “. . . No study has surfaced that refutes the dissociative amnesia hypothesis by failing to get reports of inability to voluntarily recall repeated childhood abuse” (see also Brown et al., 1998, pp. 194–195). Schefflin and Brown (1996) and Brown et al. (1998) argued that the fact that no study has failed to find reports of prior periods of impaired memory for childhood abuse provides strong evidence for the existence of dissociative or traumatic amnesia. In fact, however, the dissociative amnesia hypothesis fails the important scientific criterion of falsifiability unless rates of reports of prior periods of impaired memory for childhood abuse are compared to rates of such reports for comparable nontraumatic childhood experiences. If the baseline rate of reporting prior periods of less or no memory for traumatic childhood experiences is equivalent to that for comparably salient nontraumatic childhood experiences, then ordinary forgetting would be an equally appropriate (and more parsimonious) explanation for both. A trauma-specific amnesic process would require the postulation of cognitive, neurological, and physiological responses to traumatic events that differ qualitatively from those of nontraumatic events. Neuroscience researchers have, in fact, suggested a variety of such mechanisms (e.g., Bremner et al., 1997; Yehuda & Harvey, 1997) but it is not clear that extant evidence compels them.

There are few data that provide baseline comparisons for claims about amnesia caused by childhood trauma. We are aware of only two studies in which researchers included either a within-participants comparison event (van der Kolk & Fisler, 1995) or a control group (Albach, Moorman, & Bermond, 1996). In the van der Kolk and Fisler study, participants were recruited who were “haunted by memories of terrible life experiences” (p. 514). These individuals responded to a series of questions about the disturbing (traumatic) event(s) that brought them to the laboratory and about one “personally highly emotionally significant, but nontraumatic event” (p. 515). They were asked whether they had “always been aware that the trauma/event happened.” Whereas 42% of the the traumatic events were characterized as amnesic, none of the nontraumatic events were so characterized. Although we admire van der Kolk and Fisler for including a control event, we suspect that their procedure may have underestimated the frequency of prior periods of forgetting nontraumatic events. Their respondents were first asked to remember an emotionally significant childhood event, then asked questions about their prior memory for that event: It is likely that this procedure would bias the selection of control events toward those that respondents had frequently retrieved and remembered well.

Albach et al. asked 97 women who had reported experiences of severe childhood sexual abuse if there had been a prior period of time during which they had forgotten the abuse. A control group of 65 nonabused women were asked an

analogous question regarding an unpleasant but nontraumatic childhood event that they recalled for the researchers (e.g., being teased). Of the abuse survivors, 35% reported at least one episode of inability to recall the event, whereas only 1% of the control group reported such an episode. As in the van der Kolk and Fisler study, participants volunteered these events. Again, when people are asked on the spur of the moment to retrieve an unpleasant but nontraumatic event, they are likely to retrieve very memorable events that they have often previously retrieved, so this procedure is likely to bias selection of control events toward events that people have always remembered well. Also, when asked slightly different questions about these same events, control participants responded as if there had been a prior period of impaired recall because 19% said that they knew more about the event details at the interview than they had previously, 24% said that they were still unable to recall important aspects of the event, and 5% reported having had a memory-recovery experience for it.

There are good reasons to believe that the baseline for retrospective reports of prior periods of less or no memory for currently remembered nontraumatic life events is well above zero. When asked directly, people often fail to report documented life events that could be considered "significant," such as having been hospitalized or robbed (for examples, see Bradburn, Rips, & Shevell, 1987; Loftus, Garry, & Feldman, 1994). At a later time some of these respondents would possibly report having experienced a recovery of memories of these events. More direct evidence comes from a study by Read (1997), in which 60% of a large, nonclinical, community sample of adults readily described at least one life event (or series of events) for which they reported a prior period of limited or no memory. For many reports the event was a one-time and, likely, relatively insignificant event, such as having eaten at a particular restaurant, for which ordinary forgetting might be expected. However, 23% of the reports involved sustained or repeated activities such as sports camps and music lessons, personal events for which extensive forgetting might not be anticipated. Other events for which participants described prior periods of forgetting were emotional (and perhaps even traumatic) experiences, such as parental discord and sexual abuse. When the various event categories were compared, however, Read found that traumatic and nontraumatic childhood events were equally likely to have been accompanied by a report of a period of partial or complete amnesia. Further, Read (1997) and Edwards and Fivush (1998) reported that about 15% to 20% of adults in the general population report "significant gaps" in their memory for periods of childhood after age 5 years. We anticipate that if nontraumatic life events were queried from these periods, participants would very frequently report limited memory.

In summary, survey research attempting to document and measure traumatic amnesia has typically omitted appropriate control conditions assessing the base rate of reports of prior periods of less or no memory for nontraumatic events. Without appropriate controls, it is impossible to determine whether traumatic experiences are more or less likely to give rise to such reports than are other sorts of life events

and, hence, impossible to know whether forgetting of trauma may involve a special amnesia mechanism.

The difficulties of measuring the incidence of amnesia are compounded by the problematic nature of retrospective memory judgments in general (see Bradburn et al., 1987; Henry, Moffitt, Caspi, Langley, & Silva, 1994) and in clinical settings (Schrader, Davis, Stefanovic, & Christie, 1990). Researchers have frequently commented on the paradox entailed in asking people to evaluate their past ability to recollect an event during a period when they may not have recalled that event (e.g., Dalenberg, 1996; Read, 1997; Schooler, 1994). Researchers have less often discussed the heuristics respondents might use to answer such questions (see Bradburn et al., 1987; Pearson, Ross, & Dawes, 1991). Schooler, Bendiksen, and Ambadar (1997) reported case studies of five women who had emotionally wrenching subjective experiences of "recovering" memories of traumatic childhood events that were reasonably well corroborated; interestingly, in two of the cases other people reported that the woman had previously told them of the trauma during the period of time when the woman believed she had been amnesic for it. Schooler et al. speculated that the emotional intensity of the experience of "discovering" the memory may have given rise to what they termed the "forgot it all along effect" [by analogy to Fischhoff's (1982) "knew it all along effect," in which people mistakenly believe that they previously knew things that they had in fact only learned during the experiment]. Thus cognitive heuristics may give rise to illusory impressions of a prior lack of memory.

An additional confounding factor in the search for evidence of traumatic amnesia is that some or all of the respondents in many of the studies had been involved in sustained therapy specifically regarding their abuse experiences (e.g., Briere & Conte, 1993; Feldmann-Summers & Pope, 1994; Gold et al., 1994; Herman & Schatzow, 1987). This raises the possibility that expectancies or demand characteristics arising from trauma memory-oriented therapies may have influenced responses in some participants (see Kihlstrom, 1994; Lindsay & Read, 1994; Read & Lindsay, 1994; Schooler, 1994). Furthermore, and most relevant to the current paper, engaging in extended attempts to remember childhood trauma may change individuals' perceptions of their prior ability to remember such events. To the extent that such searches involve suggestive influences that lead to "false memories" in some individuals, such people would likely report that they were previously amnesic for the events. It is noteworthy that the research samples that provided the highest estimates of amnesia involved adults who had received specific and extensive therapy for childhood sexual abuse, from the 59% reported by Briere and Conte (1993) to the 64% by Herman and Schatzow (1987) to the 77% reported by Roe and Schwartz (1996). The lowest estimate, 16%, comes from the Williams (1995) study in which few of the participants had received extended therapy for the consequences of the documented sexually abusive events.

Even in the absence of suggestive influences and false memories, engaging in efforts to remember childhood events may alter perceptions of one's prior ability

to remember those events. For example, Belli, Winkielman, Read, Schwarz, and Lynn (1998) demonstrated that participants' assessments of their childhood memories after age 5 years were influenced by their earlier attempts to retrieve memories of childhood events. In fact, the more events participants recalled from their childhoods, the less complete they subsequently judged their autobiographical memories for childhood. By extension, if questions regarding prior periods of less or no memory for particular childhood events followed extended efforts to remember those events, judgments of the completeness of prior memory might reflect a discounting of the amount of information available before the retrieval efforts (cf. Pearson et al., 1991; Read, 1997; Schooler et al., 1997). At a minimum, to the extent that efforts to remember childhood events are successful, they will give rise to reports of a prior period (i.e., before the retrieval efforts) of less memory for those events. Indeed, merely answering a series of specific questions regarding a childhood event may be sufficient to lead people to remember details of which they have not thought for years and, hence, give rise to reports of prior periods during which they remembered less about the event.

Relatedly, the clinical literature provides examples of retrospective overestimates of the pretreatment severity of cognitive, emotional, and health-related impairments following treatment or therapeutic intervention (e.g., Schrader et al., 1990). A variety of explanations for such reconstructive distortions has been offered by Keuler and Safer (1999), ranging from the evolutionary advantages of avoiding certain events to the self-enhancing benefits of believing that an impairment has been overcome (for related evidence and hypotheses, see Ross, 1989). In line with these empirical findings it would be anticipated that after memory-oriented treatment for childhood sexual abuse adult patients would judge their pretherapy memory impairments to have been more severe than they actually were before treatment. This may be particularly true if impaired memory is seen as a focal disorder to be treated in therapy.

In summary, considering the difficulty of retrospective assessments of prior ability to remember, the potential impact of prior retrieval attempts, and the demand characteristics potentially inherent in the clinical and memory testing situations, it is not surprising that substantial percentages of respondents in previous research reported prior periods of impaired memory for childhood traumas. It may be that reports of prior periods of memory impairment for significant nontraumatic childhood events would arise with equal frequency under comparable conditions.

The present study explored the impact of extended retrieval activities on judgments of prior periods of partial and complete "amnesia" for a set of 11 potentially significant nontraumatic childhood events such as summer camps, music lessons, and high school graduation ceremonies. Following Elliott and Briere (1995), "amnesia" was operationally defined as an affirmative response to a question regarding a prior period of less memory ("partial amnesia") or of no memory ("complete amnesia") for the event. (As noted in the Discussion, we believe these are inadequate operational definitions of "amnesia," and we use that term here only to

connect with the prior research.) Participants initially indicated whether they had experienced each of the 11 life events. For each one reported, they were asked about prior periods of less and no memory. They were also asked to rate the completeness of their recollections of each reportedly experienced event, and to describe one of these events (selected by the researchers) in as much detail as possible. Subsequently, each participant was encouraged over a 4-week period to recall additional details of this target event. At the final interview, participants responded to the same questions asked at the first interview.

Method

Participants

Forty-three Canadian volunteers completed the 4-week experiment in return for a \$50 honorarium. The mean age of the 19 women was 39.4 years (range, 27–51 years) and that of the 24 men was 43.2 years (range, 27–69 years). Participants were recruited from a larger group of 413 who had completed a survey 2 years earlier regarding their beliefs about human memory (Read, 1997). Selections were made from the subset of 187 who had previously agreed to participate in further research studies. Of these, 107 could still be contacted by telephone and of these we selected the first 50 respondents who also had attained high school graduation and were at least 27 years of age. Of the 50 participants who began the study, 7 were eventually dropped because their schedules precluded their full participation.

Design and Procedure

The 11 childhood and adolescent experiences selected for study were: music/dance lessons, sports camps, summer camps, sports team/competitions, Boy Scout/Girl Guide events, high school graduation, driver's license test, first summer or part-time job, extended trips, special events or holidays, and family reunions. Following an initial telephone interview, volunteers responded to a questionnaire similar to the one they had completed 2 years earlier (as part of a separate project to assess reliability of that instrument) and then indicated whether they had experienced each of the 11 life events. On average, the participants reported having experienced 6.84 ($SD = 1.76$) of the events. One event was selected from each participant's list for the purpose of extended retrieval activities; however, this selection was not announced until the first in-person interview, which occurred from 2 to 4 weeks later. The event selected for retrieval for each participant was taken from either the participants' adolescent (i.e., high school graduation; $n = 18$) or childhood periods (i.e., music/dance lessons, summer camps, Boy Scout, or Girl Guide activities; $n = 25$). For our 43 participants, high school graduation occurred,

on average, 23.2 years prior to the experiment, whereas the three types of childhood events occurred, on average, 32.4 years prior to the experiment.

During the first in-person interview, participants answered questions about all of the events they had reported experiencing. The questions of central interest were “Was there ever a period of time when you remembered less of the event than you do now?” and “Was there ever a period in which you had no memory of this event?” The response options provided were No, Unsure, and Yes. Participants were also asked, for each reportedly experienced event, to rate their current memory for that event relative to what they believed they would have been able to remember the day after the event (from 0% to 100%). Following these questions, each participant was asked to report in as much detail as possible everything they could recall about the specific target event we had selected. The narratives were tape recorded. Participants then received instructions concerning the next 4-week period, during which they were to attempt to retrieve more information about the selected target event. They were informed that they would be contacted by telephone on at least two occasions and that a final in-person interview would be scheduled to take place in about 4 weeks.

Participants were randomly assigned to either “Reminiscence” or “Enhanced” retrieval conditions, with the restriction that approximately equal proportions of men and women and of childhood and adolescent target events were placed in the two conditions. Reminiscence Condition participants were instructed to spend as much time as possible thinking about the event over the next 4 weeks and to attempt to recall as many details (e.g., people, places, conversations, etc.) as they could. Participants in the Enhanced Condition received the basic reminiscence instructions but were also especially encouraged to speak to family members and others about details of the events, to search for photographs that might be related to the event, and, if possible, to revisit the environmental context in which the event occurred. These instructions were reiterated during the two telephone interviews (approximately 1 and 2 weeks after the initial in-person interview), during which the Enhanced Condition participants were also asked numerous additional pointed questions about potential details in the event (e.g., “Have you thought about the smell of the room?” and “Have you attempted to recall other people involved?”) and were instructed in regard to mental context reinstatement and guided imagery exercises. Additionally, participants were asked at the two telephone interviews and the final interviews to estimate the numbers of times they had thought about the target since the last interview. For the remaining events no additional retrieval was encouraged. Hence, across subjects and events three conditions were created: No Retrieval, Reminiscence, and Enhanced Retrieval. Apart from the encouragement of different levels of effort directed at their retrieval of the target event, Reminiscence and Enhanced Condition participants received identical instructions.

During the final in-person interview, participants were asked the same questions as in the initial interview (i.e., judgments regarding prior periods of partial and complete amnesia, ratings of the completeness of their recollections of each of the

experienced events, and free narrative reports of everything they could remember about the target event). Participants were then debriefed.

Results

Baseline (Preretrieval) Assessments of Partial and Complete Amnesia

Across all subjects and reportedly experienced events ($N = 294$), 16% received Yes responses for the partial amnesia question and 5% received Yes responses for the complete amnesia question. Both of these percentages were significantly greater than zero [smallest $t(293) = 3.85$, $p < .01$]. In other words, before any extended retrieval activity participants reported prior periods of partial or complete amnesia for 21% of the events. Of the 43 participants, 47% reported partial amnesia for at least one event, and 28% reported complete amnesia for at least one event. Again, both of these values were significantly greater than zero [smallest $t(42) = 3.93$, $p < .01$].

Table 1 presents the percentages of participants who reported partial or complete amnesia for particular kinds of events. Although reports of a prior period of less or no memory were numerically more common for some events than for others, overall chi-square comparisons were nonsignificant [largest $\chi^2(10, N = 294) = 9.73$, $p \geq .05$]. Specific comparisons between event types might yield reliable differences but their understanding will not be addressed here.

At the first interview participants were also asked, for each reportedly experienced event, to assign a value between 0% and 100% to reflect the completeness of their current memory for that event, relative to what they believed would have been available to them the day after the event. The values assigned ranged from

Table 1. The Percentages of “Yes” Responses to the “Less Memory” (Partial Amnesia) and “No Memory” (Complete Amnesia) Questions About Life Events at the First Interview

Event ^a	Less Memory	No Memory	Total
Music/dance lessons (32)	18.75	3.13	21.88
Sports camps (12)	8.33	8.33	16.66
Summer camps (32)	15.63	0.0	15.63
Sports teams/competitions (29)	17.24	3.45	20.69
Boy Scouts/Girl Guides (24)	12.50	0.0	12.50
High school graduation (35)	11.43	2.86	14.29
Driver’s test (37)	10.81	2.70	13.51
Summer job (42)	16.67	7.14	23.81
Extended trip (19)	15.79	10.53	26.32
Special event/holiday (23)	30.43	8.70	39.13
Family reunion (9)	22.22	22.22	44.44
Total (294)	15.99	5.10	

^aThe numbers of participants who reported having experienced each event are in parentheses.

0% to 100%, with an overall mean of 47% ($SD = 23\%$). Not surprisingly, our participants often believed that their memories for the listed events were impoverished relative to what they would have remembered soon after the events. The mean values assigned the subset of 18 graduation and 25 childhood target memories were 58% ($SD = 24\%$) and 41% ($SD = 30\%$), respectively. In agreement with what was predicted given the different retention intervals of the two types of events (and, perhaps, the uniqueness and salience of the graduation event), statistical comparison revealed participants' perceptions of the completeness of their memories of the two events to differ significantly [$F(1, 41) = 3.65$, $MSE = 779.61$, $p < .05$ (one-tailed)]. For comparison, individual means were calculated for the participants' estimates of completeness assigned to their No Retrieval events. The mean of these values was 48% ($SD = 26\%$).

Pre- and Postretrieval Assessments: Partial Amnesia

At the final interview participants provided, for all reportedly experienced events, the same assessments as completed during the first interview. Figure 1

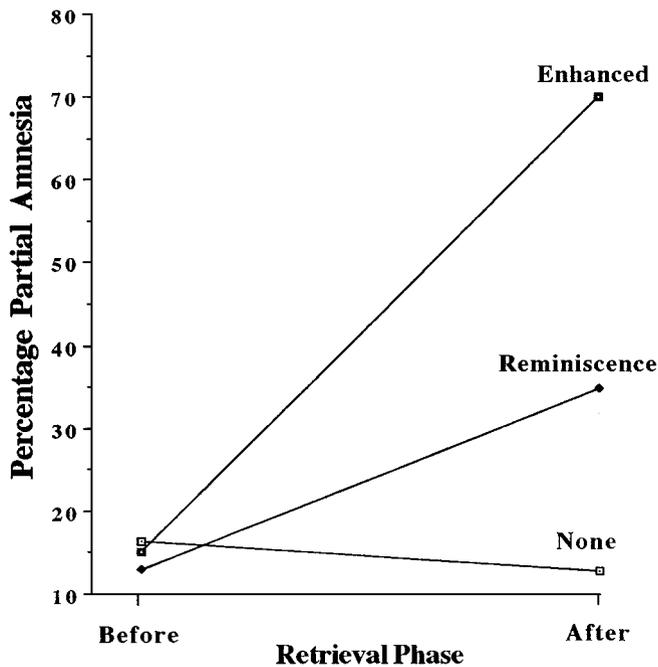


Fig. 1. The percentage of Yes responses to the "partial amnesia" question at the preretrieval and postretrieval phases for reportedly experienced events in the No Retrieval, Reminiscence, and Enhanced Retrieval conditions.

presents the percentage of events for which a “Yes” response was given to the question on partial amnesia (“Has there ever been a period of time during which you recalled less of this event than you do now?”) as a function of stage of the research (pre- vs. postretrieval) and of the type of retrieval activity engaged in by the participants. At the first interview the events selected for either No Retrieval ($n = 251$), Reminiscence ($n = 23$), or Enhanced ($n = 20$) recollection activities were equally likely to receive a Yes response, 16%, 13%, and 15% respectively, as reflected in a nonsignificant chi-square test ($\chi^2 < 1$). Similarly, the difference between the Reminiscence and the Enhanced events was nonsignificant at the preretrieval stage ($\chi^2 < 1$).

On the other hand, as is clear from Fig. 1, for the events that received retrieval activity during the subsequent 4 weeks the likelihood of receiving a Yes response to the partial amnesia question increased markedly. Further, the magnitude of this increase was related to the type of retrieval activity engaged in, such that the Enhanced instructions produced more Yes responses (70%) than did the Reminiscence instructions (35%) alone. In contrast, the percentage of Yes responses to the events that received no retrieval remained at 16%. Whereas a comparison of the Reminiscence and Enhanced conditions revealed no difference before retrieval, the same comparison after retrieval activities produced a large and significant difference in the frequency of Yes responses [$\chi^2(1, N = 43) = 5.31, p < .05$]. The large differences between the three event conditions seen at the postretrieval stage in Fig. 1 were supported by a significant chi-square [$\chi^2(2, N = 294) = 44.91, p < .05$]. Because the inclusion of the nonretrieved events across both the Reminiscence and the Enhanced Recall Condition participants violates the assumption of independence of observations required for chi-square in this overall comparison, separate comparisons of the No Retrieval events from the Enhanced Recall condition with the target events in the Reminiscence condition and, alternatively, the No Retrieval events in the Reminiscence condition with the target events of the Enhanced Recall condition were completed. In both comparisons, target and nontarget events were significantly different in the numbers of Yes responses at the postretrieval phase [smallest $\chi^2(2, N = 136) = 19.29, p < .05$]. Subsequent comparisons of the childhood target events with the more recent adolescent target event in the Reminiscence and Enhanced Conditions revealed equivalent gains in Yes responses from pre- to postretrieval assessments of memory (all χ^2 's < 1).

To include all response choices to the target items, mixed model analyses of variance (ANOVAs) compared pre- and postretrieval responses regarding prior periods of partial amnesia for target items across the Reminiscence and Enhanced conditions and, separately, across the childhood and adolescent target events. For this purpose, a response of “No” was scored as 1, “Not Sure” as 2, and “Yes” as 3. Analyses revealed large and significant increases in ratings across the retrieval interval [smallest $F(1, 41) = 19.17, \text{MSE} = 0.525, p < .001$]. Whereas the interaction of Retrieval phase with Condition was marginally significant [$F(1, 41) = 3.54, \text{MSE} = 0.484, p = .07$] and is reflected in the differential gains by Reminiscence

and Enhanced Recall participants shown in Fig. 1, the childhood and adolescent targets increased at equal rates in Yes responses from pre- to postretrieval stages ($F < 1$). In summary, the results clearly demonstrate that in the final interview participants much more frequently reported prior periods of less memory for the target events than for the control events.

Participants were also asked to estimate the number of times they had thought about the target event during each period between the four interviews. Response options were categories of frequencies (1–3, 4–6, and so forth). The categorical data were analyzed in a 2×3 mixed-model ANOVA, with retrieval condition as the between-subjects variable and interview (second, third, or fourth) as the repeated measure. There was a tendency for participants in the Enhanced Condition participants ($M = 5.66$) to report more thoughts about the target event between interviews than Reminiscence Condition participants ($M = 4.46$), but the effect fell short of significance [$F(1,41) = 3.84$, $MSE = 2.97$, $p = .057$]. The frequency of reported thoughts did not vary with interview nor did interview interact with condition ($F_s < 1$). Unfortunately, even a significant difference would not inform us as to the nature or duration of the participants' thoughts in the two conditions.

Participants' assessments of their current memories for the retrieved events relative to what they believed they could have remembered shortly after the event increased modestly but reliably from pretest to posttest: from 48% to 56% [$F(1,41) = 4.28$, $MSE = 288.84$, $p < .05$]. However, despite a numerically larger gain from pre- to postretrieval in estimated memory for the Enhanced ($M = 11\%$) than the Reminiscence Condition participants ($M = 4\%$), neither the effect of condition nor its interaction with retrieval phase (pre vs. post) was significant [largest $F(1,41) = 1.74$]. Interestingly, a number of respondents indicated that the increase in the completeness of their recollections due to the retrieval exercise was offset by the realization, born through the retrieval exercise, that they were still unable to remember many details and that they might yet be able to retrieve substantially more, given the amount of new information that they recalled over the course of the experiment. In general, the retrieval exercise appeared to have generated rather large-scale transformations of some participants' views of the integrity and completeness of their memories, resulting in wide variability in the estimates provided for completeness of memory for the target event at posttest ($SD = 28\%$). Importantly, however, a separate ANOVA indicated that the no-retrieval events did not change in average rating from preretrieval ($M = 47\%$, $SD = 23\%$) to postretrieval ($M = 45\%$, $SD = 24\%$; $F < 1$).

Finally, when asked to assess to what extent their memory for the target event had changed over the course of the study, participants reported, on average, a perceived increase of 29% ($SD = 23\%$) more available information, a value significantly different from zero [$t(42) = 2.52$, $p < .05$]. Although the Enhanced Recall condition participants again gave a numerically higher estimate of gain (46%) than did the Reminiscence condition participants (15%), the difference was not significant [$F(1,41) = 2.34$, $MSE = 513.46$, $p > .05$]. Inspection of these data

again revealed large variability in the responses, perhaps because the participants frequently reported quite different interpretations of their memories following than before the retrieval activity. Additional analyses of the relationship between perceived gain and responses to the partial amnesia question found no significant differences and thus provided little insight into this potential relationship.

Pre- and Postretrieval Assessments: Complete Amnesia

In response to the complete amnesia question at the initial interview, statistically equivalent rates of Yes responses were received by the No Retrieval (5%; $n = 251$), Reminiscence (9%; $n = 23$), and Enhanced Recall (0%; $n = 20$) condition events. Only the No Retrieval response rate reliably exceeded zero [$t(250) = 3.67$, $p < .01$]. The same pattern of small differences between these conditions was maintained at the final interview 4 weeks later, with response rates of 5%, 9%, and 5% in the No Retrieval, Reminiscence, and Enhanced conditions, respectively. As before, only the rate of Yes responses to the No Retrieval events reliably exceeded zero [$t(250) = 3.38$, $p < .01$]. Analyses completed with all responses to the “no memory” question and weighted as above with scores 1, 2, and 3 to the No, Not Sure, and Yes options, respectively, revealed no significant differences from pre- to postretrieval by conditions (Reminiscence vs. Enhanced Recall) or type of event (childhood vs. adolescent) (largest $F = 2.65$, $p > .10$). In summary, reports of prior periods of complete amnesia reliably exceeded zero for control (no retrieval) events but sustained retrieval activities did not reliably affect reports of complete amnesia for target events.

Measures of Target Event Description

Participants' narratives of the target event were assessed at the pre- and post-retrieval interviews in terms of narrative duration (from the tape recordings) and word counts (from the transcribed interview protocols). Not surprisingly, both measures increased significantly [smallest $F(1,41) = 29.13$, $p < .001$] and well demonstrate the effects of repeated testing described by Roediger, McDermott, and Goff (1997). The magnitude of the average gain for words, for example, was a 150% increase in number. However, neither the type of retrieval activity nor the type of event had a significant effect on the word count or narrative duration measures.

Discussion

Several features of the results are relevant to claims regarding the amnesic consequences of sexual abuse. First, on the basis of our participants' reports at the

first interview (before any special retrieval activities), it is clear that the baseline for reported prior “amnesia” for nontraumatic life events (against which claims of the amnesic consequences of abuse might be compared) is not zero. Indeed, the baseline level of reporting a prior period of less or no memory for nontraumatic events was 21%, a value lower than many, but higher than some, reported for childhood sexual abuse (e.g., Williams, 1995). Further, following a 4-week period of active memory retrieval the rate of reports of prior periods of less memory for nontraumatic events increased dramatically.

It would be inappropriate to assume that the retrieval efforts of our participants were comparable to those of abuse survivors in previous research, and therefore, the baseline level appropriate to any particular research study reported in the literature could be substantially higher, or lower, than that we obtained. Nor do we claim that the set of life events queried in this study is the most appropriate set of control items for studies of memory for childhood sexual abuse experiences. Instead, one might wish to compare other life events that may be considered similar to sexually abusive events in terms of their duration, frequency, age at onset, salience, emotional arousal, and, most importantly, the extent to which participants have previously engaged in extended efforts to remember those experiences. Our point is that reports of prior periods of partial or complete “amnesia” may be common for nontraumatic events and that this must be taken into account when interpreting data on reports regarding memory for traumatic events. For example, Gold et al. (1994) noted that, following therapy, their respondents spontaneously reported their pretherapeutic memories to be much more fragmentary than they had originally assumed. Our results indicate that such reports are likely to follow any period of sustained recollective activity about life experiences, rather than being peculiar to memories of traumatic events.

During debriefing we discussed with participants their reasons for reporting prior periods of less memory for the target event. Their answers were consistent with our general point: they reported that while thinking about the target event they remembered details of which they had not thought for many years. In essence, they reported prior periods of remembering less about the target event simply because they had recently remembered more than they had for years. The finding that the Enhanced Retrieval instructions led to significantly larger increases in reports of prior periods of less memory for the target event than did Reminiscence instructions supports the conclusion that the more new information is retrieved, the more prior memory is judged to have been incomplete (cf. Belli et al., 1998). This finding is also important because it argues against a simple demand characteristics interpretation of these data: both groups were aware that our interest was primarily in the target events but were unaware of the differences in instructions in the two conditions. Overall, these findings should not be surprising, but they have obvious implications for the interpretation of studies in which participants who recently received trauma memory-oriented therapy, or who engaged in self-help memory exercises, or who have just completed a lengthy and detailed interview regarding

their sexual history are asked about prior periods of less memory for childhood trauma.

Reports of prior periods of “no memory” were relatively rare but significantly above zero for control events at both the initial and the final interview. The rate of no-memory reports was not affected by the retrieval activities in our experiment. This is not surprising, of course, because participants were asked to work at remembering an event only if they initially reported they had experienced it. It is interesting to speculate, however, about the results of a study akin to this one in which participants were asked to work at remembering significant childhood events that they initially reported they had not experienced. Our prediction is that some such people would experience “memory recovery” (accurate or not) as a result of the reminiscence activities and would, therefore, subsequently report a prior period of no memory for that event.

Several participants indicated during debriefing that they had been surprised by the difficulty of retrieving additional details of the target event. Indeed, one participant required considerable debriefing before she was willing to accept our assurances that the limitations of her long-term memory (of which she became aware while attempting to reminisce about a target event) were not evidence of a pathologically impaired autobiographical memory. It is possible that people generally overestimate their ability to recollect details of significant childhood and adolescent events—a bias that could account for the surprise expressed by some of our participants and for the assumption, in the literature, that “partial amnesia” is peculiar to trauma (see Lindsay, 1999).

We believe that operationalizing “amnesia” in terms of responses to a single question about prior periods of remembering less about an experience mischaracterizes what is usually meant by the term “amnesia.” “Amnesia” implies an abnormal kind of forgetting, mediated by special mechanisms distinct from those of ordinary forgetting, and there is nothing about our results that indicates the operation of such a mechanism. Our point, of course, is that our study does not differ in this regard from studies purporting to measure “amnesia” for childhood trauma. Interestingly, because respondents in such studies have not been asked if they would characterize their prior periods of limited memory as reflecting “amnesia,” this term may not even well represent the participants’ perceptions of their prior ability to remember the trauma (cf. Williams, 1995). Consistent with this possibility, in several studies of abuse survivors’ reports of the effects of childhood sexual abuse, respondents virtually never mentioned memory impairment and never mentioned amnesia as a perceived consequence of their sexually abusive experiences (Beitchman, Zucker, daCosta, & Cassavia, 1992; Cole & Putnam, 1992; Moeller, Bachmann, & Moeller, 1993). Thus, it appears that “amnesia” is a researcher’s rather than a survivor’s description of a type of memorial or metamemorial experience. Similarly, Melchert and Parker (1997) reported that not one of 38 participants who had experienced “recovered” memories of sexual, physical, or emotional abuse described their prior perceived inability to recall the experience to be a result of having “no

memory” for the event. Instead, their participants provided a variety of other kinds of reasons, unrelated to pathological memory impairment, for nonreporting.

We want to emphasize that our findings do not constitute evidence against the hypothesis that traumatic experiences are more likely to be forgotten than equally salient nontraumatic events. Indeed, we think it is likely that in some cases ordinary mechanisms of memory (e.g., poor encoding, avoidance of retrieval cues) can hasten the forgetting of traumatic events relative to equally salient nontraumatic events (e.g., Joslyn, Carlin, & Loftus, 1997; Lindsay & Briere, 1997; Schooler, 1997). It also remains possible that sexual abuse experiences do have quantitatively and qualitatively different effects on long-term memory than do other kinds of life experiences (e.g., a special trauma-related amnesia mechanism). Our points are that (a) such hypotheses can be tested only by comparing memory for traumatic experiences with memory for appropriate control experiences and (b) in such studies the two types of experiences must be equated on a number of dimensions, including prior retrieval efforts. None of the existing studies meets this criterion. The ball has landed firmly in the court of those claiming that trauma has special amnesic consequences and thus it is left to them to demonstrate that the claimed memory impairments go beyond what would be anticipated by ordinary forgetting and the influence of cognitive heuristics and demand characteristics in the testing situation. At this stage we believe that it is not unreasonable to speculate that ordinary forgetting has been pathologized by widespread uncritical acceptance of the findings reviewed by Brown et al. (1998) as evidence of amnesia (cf. Loftus, Garry, & Feldman, 1994).

Why does it matter whether victims of childhood sexual abuse develop amnesia for the abuse or merely forget it via ordinary mechanisms of forgetting? At one level, the distinction may seem a mere semantic quibble. From that perspective, the important point is that a variety of kinds of evidence indicate that child-abuse victims can experience extended periods in adulthood during which they do not report childhood sexual abuse (even when cued). That is indeed an important point (as is the fact that there are also grounds to believe that some such people can later recollect the previously unreported abuse if appropriately cued). But the distinction between amnesia and ordinary forgetting is nonetheless an important one, intimately linked to other issues in the controversy regarding memory-recovery work in therapy. The term “amnesia” connotes a pathological condition, created via special mechanisms distinct from those of ordinary forgetting. The construal of nonremembering of childhood trauma as a pathological condition carries with it the implication that nonremembering of trauma is a condition in need of treatment. Relatedly, some accounts of traumatic amnesia propose that the same special mechanism that impairs conscious recall of traumatic experiences also preserves hidden memories of the trauma in a preternaturally vivid and veridical form and that such hidden memories have maleficent effects unless and until they are recovered and integrated into conscious memory (van der Kolk & Fisler, 1995). Widespread acceptance of the ideas that amnesia is a common consequence of childhood sexual

abuse, that hidden memories can be detected on the basis of symptoms, and that recovering such memories is an important aim or by-product of psychological intervention may lead clinicians inappropriately to foster memory recovery. As many psychologists and professional organizations have argued, such attempts may be unjustified and risky [see Grunberg & Ney (1997) for the responses of 10 professional organizations]. In contrast, if nonremembering of childhood trauma is attributed to ordinary forgetting (perhaps accelerated by normal coping mechanisms), then the rationale for fostering memory recovery becomes less clear. Thus questions regarding the mechanisms underlying reports of prior periods of less or no memory for currently remembered childhood traumas are close to the heart of the controversy regarding memory-recovery work and recovered-memory experiences, and their answers have important implications for therapeutic practice.

Acknowledgments

This research was supported by National Sciences and Engineering Research Council of Canada and Alberta Law Foundation grants to the senior author. The authors are indebted to Sheila Collar and Andrea Nadon for their assistance in interviewing and to Michelle Arnold for organization and data analyses. A subset of the data described herein was presented at the 1997 meeting of the Canadian Society for Brain, Behaviour, and Cognitive Science.

References

- Albach, F., Moormann, P. P., & Bermond, B. (1996). Memory recovery of childhood sexual abuse. *Dissociation, IX*, 261–273.
- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: APA.
- Beitchman, J. H., Zucker, K. J., daCosta, G. A., & Cassavia, E. (1992). A review of the long-term effects of child sexual abuse. *Child Abuse & Neglect, 16*, 101–118.
- Belli, R. F., Winkelman, P., Read, J. D., Schwarz, N., & Lynn, S. J. (1998). Recalling more childhood events leads to judgments of poorer memory: Implications for the recovered/false memory debate. *Psychonomic Bulletin & Review, 5*, 318–323.
- Bradburn, N. M., Rips, L. J., & Shevell, S. K. (1987). Answering autobiographical questions: The impact of memory and inference on surveys. *Science, 236*, 157–161.
- Bremner, J. D., Southwick, S. M., & Charney, D. S. (1997). Neuroanatomical correlates of the effects of stress on memory: Relevance to the validity of memories of childhood abuse. In P. S. Appelbaum, L. A. Uyebara, & M. R. Elin (Eds.), *Trauma and memory: Clinical and legal controversies* (pp. 61–92). New York: Oxford University Press.
- Brewin, C. R. (1997). Clinical and experimental approaches to understanding repression. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 145–170). New York: Plenum.
- Briere, J. (1997). An integrated approach to treating adults abused as children with specific reference to self-reported recovered memories. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 25–48). New York: Plenum.
- Briere, J., & Conte, J. (1993). Self-reported amnesia for abuse in adults molested as children. *Journal of Traumatic Stress, 6*, 21–31.

- Brown, D., Schefflin, A. W., & Hammond, D. C. (1998). *Memory, trauma treatment, and the law*. New York: W. W. Norton.
- Carlson, E., Armstrong, J., & Loewenstein, R. (1997). Reported amnesia for childhood abuse and other traumatic events in psychiatric inpatients. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 395–402). New York: Plenum.
- Cole, P. M., & Putnam, F. W. (1992). Effects of incest on self and social functioning: A developmental psychopathology perspective. *Journal of Consulting and Clinical Psychology, 60*, 174–184.
- Dalenberg, C. (1996). Accuracy, timing and circumstances of disclosure in therapy of recovered and continuous memories of abuse. *Journal of Psychiatry & Law, 24*, 229–275.
- Edwards, V., & Fivush, R. (1998). *Autobiographical memory disruptions in adult survivors of childhood sexual abuse*. Paper presented at the American Psychology-Law Society Biennial Meeting, Los Angeles, CA, Mar.
- Elliott, D., & Briere, J. (1995). Post traumatic stress associated with delayed recall of sexual abuse: A general population study. *Journal of Traumatic Stress, 8*, 629–647.
- Feldman-Summers, S., & Pope, K. S. (1994). The experience of “forgetting” childhood abuse: A national survey of psychologists. *Journal of Consulting and Clinical Psychology, 62*, 636–639.
- Fischhoff, B. (1982). For those condemned to study the past: Heuristics and biases in hindsight. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp. 335–351). New York: Cambridge University Press.
- Garry, M., Loftus, E. F., & Brown, S. W. (1994). Memory: A river runs through it. *Consciousness and Cognition, 3*, 438–451.
- Gold, S. N., Hughes, D., & Hohnacker, L. (1994). Degrees of repression of sexual abuse memories. *American Psychologist, 49*, 441–442.
- Grunberg, F., & Ney, T. (1997). Professional guidelines on clinical practice for recovered memory: A comparative analysis. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 541–556). New York: Plenum.
- Henry, B., Moffitt, T. E., Caspi, A., Langley, J., & Silva, P. A. (1994). On the “remembrance of things past:” A longitudinal evaluation of the retrospective method. *Psychological Assessment, 6*, 92–101.
- Herman, J., & Schatzow, E. (1987). Recovery and verification of memories of childhood sexual trauma. *Psychoanalytic Psychology, 4*, 1–14.
- Joslyn, S., Carlin, L., & Loftus, E. F. (1997). Remembering and forgetting childhood sexual abuse. *Memory, 5*, 703–724.
- Keuler, D. J., & Safer, M. A. (1999). Memory bias in the assessment and recall of pre-exam anxiety: How anxious was I? *Applied Cognitive Psychology, 12*, 127–138.
- Kihlstrom, J. F. (1994). The trauma-memory argument. *Consciousness and Cognition, 4*, 63–67.
- Lindsay, D. S. (1999). Recovered-memory experiences. In S. Taub (Ed.), *The legal treatment of recovered memories of child sexual abuse*. Springfield, IL: Charles C Thomas (in press).
- Lindsay, D. S., & Briere, J. (1997). The controversy regarding recovered memories of childhood sexual abuse: Pitfalls, bridges, and future directions. *Journal of Interpersonal Violence, 12*, 631–647.
- Lindsay, D. S., & Read, J. D. (1994). Psychotherapy and memories of childhood sexual abuse: A cognitive perspective. *Applied Cognitive Psychology, 8*, 281–338.
- Lindsay, D. S., & Read, J. D. (1995). “Memory work” and recovered memories of childhood sexual abuse: Scientific evidence and public, professional, and personal issues. *Psychology, Public Policy, & Law, 1*, 846–908.
- Loftus, E. F., Garry, M., & Feldman, J. (1994). Forgetting sexual trauma: What does it mean when 38% forget? *Journal of Consulting and Clinical Psychology, 62*, 1177–1181.
- Loftus, E. F., Polonsky, S., & Fullilove, M. (1994). Memories of childhood sexual abuse: Remembering and forgetting. *Psychology of Women Quarterly, 18*, 67–84.
- Melchert, T. P., & Parker, L. R. (1997). Different forms of childhood abuse and memory. *Child Abuse & Neglect, 21*, 125–135.
- Moeller, T. P., Bachmann, G. A., & Moeller, J. R. (1993). The combined effects of physical, sexual, and emotional abuse during childhood: Long-term health consequences for women. *Child Abuse & Neglect, 17*, 623–646.
- Pearson, R. W., Ross, M., & Dawes, R. M. (1991). Personal recall and the limits of retrospective questions in surveys. In J. M. Tanur (Ed.), *Questions about questions: Inquiries into the cognitive bases of surveys* (pp. 65–94). New York: Russell Sage Foundation.

- Read, J. D. (1997). Memory issues in the diagnosis of unreported trauma. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 79–100). New York: Plenum.
- Read, J. D., & Lindsay, D. S. (1994). Moving toward a middle ground on the “false memory debate:” Reply to commentaries on Lindsay and Read. *Applied Cognitive Psychology*, 8, 407–435.
- Roe, C. M., & Schwartz, M. F. (1996). Characteristics of previously forgotten memories of sexual abuse: A descriptive study. *Journal of Psychiatry & Law*, 24, 189–206.
- Roediger, H. L., III, McDermott, K. B., & Goff, L. M. (1997). Recovery of true and false memories: Paradoxical effects of repeated testing. In M. A. Conway (Ed.), *Recovered memories and false memories* (pp. 118–149). Oxford: Oxford University Press.
- Ross, M. (1989). Relation of implicit theories to the construction of personal histories. *Psychological Review*, 96, 341–357.
- Schefflin, A. W., & Brown, D. (1996). Repressed memory or dissociative amnesia: What the science says. *Journal of Psychiatry and Law*, 24, 145–188.
- Schooler, J. W. (1994). Seeking the core: The issues and evidence surrounding recovered accounts of sexual trauma. *Consciousness and Cognition*, 3, 452–469.
- Schooler, J. W., Bendiksen, M., & Ambadar, Z. (1997). Taking the middle line: Can we accommodate both fabricated and recovered memories of sexual abuse? In M. Conway (Ed.), *False and recovered memories* (pp. 251–292). Oxford: Oxford University Press.
- Schrader, G., Davis, A., Stefanovic, S., & Christie, P. (1990). The recollection of affect. *Psychological Medicine*, 20, 105–109.
- van der Kolk, B. A., & Fisler, R. (1995). Dissociation and the fragmentary nature of traumatic memories: Overview and exploratory study. *Journal of Traumatic Stress*, 8, 505–525.
- Whitfield, C. (1997). Traumagenic amnesia: The evolution of our understanding from a clinical and legal perspective. *Sexual Addiction & Compulsivity*, 4, 3–34.
- Widom, C. (1997). Accuracy of adult recollections of early childhood abuse. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 49–78). New York: Plenum.
- Williams, L. M. (1994). Recall of childhood trauma: A prospective study of women’s memories of child sexual abuse. *Journal of Consulting and Clinical Psychology*, 62, 1167–1172.
- Williams, L. M. (1995). Recovered memories of abuse in women with documented child sexual victimization histories. *Journal of Traumatic Stress*, 8, 649–673.
- Yehuda, R., & Harvey, P. (1997). Relevance of neuroendocrine alterations in PTSD to memory-related impairments of trauma survivors. In J. D. Read & D. S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 221–252). New York: Plenum.