Journal of Traumatic Stress, Vol. 16, No. 3, June 2003, pp. 229–236 (© 2003)

Children's Memory for Trauma and Positive Experiences

Lucy Berliner,[1,5] Ira Hyman,[2] Ayanna Thomas,[3] and Monica Fitzgerald[4]

Characteristics of children's memory for a trauma and for a positive event were compared and relationships of memory characteristics to trauma symptoms examined in 30 children who experienced a traumatic event. Results revealed that memories for trauma tended to have less sensory detail and coherence, yet have more meaning and impact than did memories for positive experiences. Sexual traumas, offender relationship, and perceived life threat were associated with memory characteristics. Few relationships between memory characteristics and trauma symptoms were found. Therapist ratings of child memory characteristics were correlated with some child trauma memory characteristic reports. These results are consistent with other studies. Possible explanations include divided attention during the traumatic event and cognitive avoidance occurring after the event.

KEY WORDS: children's memory; traumatic memory; memory characteristics.

Introduction

Children's memory for traumatic events has received considerable attention in recent years. For the most part, accuracy of memories has been the central focus of scientific and clinical interest. Investigations into the characteristics of memory have often been concerned with identifying qualities that would distinguish true and false memories. More recently, however, questions about the nature of memory for trauma, whether it differs from memory for ordinary autobiographical events, and the relationship of memory to psychological outcomes have arisen. To date, the extant research has focused almost exclusively on adults, with few studies evaluating the characteristics of children's memories for trauma.

[1]University of Washington, Seattle, Washington.
[2]Western Washington University, Bellingham, Washington.
[3]Washington University, St. Louis, Mississipi.
[4]University of Georgia, Athens, Georgia.
[5]To whom correspondence should be addressed at Harborview Center for Sexual Assault and Traumatic Stress, 325 9th Avenue, Box 35597, Seattle, Washington 98102; e-mail: lucyb@u.washington.edu.

Children's Autobiographical Memory

Children's memory for experiences has been the subject of a large amount of research since the mid-1980s. This body of research has established that children have good memories for personally experienced events (Fivush, 1993). Children, even young ones, can also resist efforts to mislead them, especially for more central aspects of salient events (Ceci & Friedman, 2000; Goodman, Rudy, Bottoms, & Amman, 1990). There are, however, social and emotional influences that inhibit reporting by children who have actually been abused. Most children do not spontaneously report the crimes (e.g., Sauzier, 1989) and some do not reveal abuse even when asked by trained interviewers (Elliott & Briere, 1995; Lawson & Chaffin, 1992). At the same time, many laboratory and analogue studies have demonstrated that children's memories are subject to error and confabulation (Ceci & Bruck, 1993; Lindsay, 1993; Quas, Quin, Schaaf, & Goodman, 1997). It is now generally conceded that reports of abuse and trauma are likely to be vulnerable to many of the same forces that affect memory for more mundane autobiographical events, especially under conditions of suggestive questioning (Berliner & Briere, 1997; Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1997).

One line of research has examined the characteristics of memory as a means to determine whether memory reports are accurate. For example, Johnson, Hastroudi, and Lindsay (1993) found in adults that events that are perceived or experienced are characteristically different from events that are only imagined. They posited that performed or real events might have more spatial and temporal contextual attributes coded in the representation of the event. Externally generated memories should also have more sensory attributes and semantic detail than those that are imagined or dreamed. Similarly, childhood events that are personally remembered by adults are rated as more clear and complete than events that are known from other sources, such as parent stories or family pictures (Hyman, Gilstrap, Decker, & Wilkinson, 1998).

A scheme for discriminating true and probably false abuse reports by children has been developed, but it is not sufficiently reliable to be used in legal settings because both types of memories overlap in many ways (Lamb, Sternberg, Esplin, Hershkowitz, & Orbach, 1997; Ruby & Brigham, 1997). This is largely due to the fact that many qualities assumed to be indicative of validity including quantity of details, confidence, and emotional associations are not specifically associated with true reports. Cognitive psychologists have shown that false memories in children and adults can have these properties as well (e.g., Bruck, Hembroke, & Ceci, 1997; Hyman, Husband, & Billing, 1995; Hyman & Pentland, 1996; Loftus & Pickrell, 1995).

Memories for trauma are believed to sometimes have qualities that are different from those of memories for mundane experiences. Traumatic events are presumed to be more memorable and perhaps to be subject to unique memory mechanisms that would make them more indelibly engraved and resistant to ordinary memory-altering processes (e.g., van der Kolk, 1994). Trauma researchers have advanced theoretical explanations for why trauma memories might be better remembered and contain emotionally arousing qualities (Cahill & McGaugh, 1998; Koss, Tromp, & Tharan, 1995). For example, LeDoux (1994) proposed that evolutionary imperatives might have made enhanced recall of dangerous situations an adaptive memory characteristic in the ancestral environment where physical threats to survival were ever present. As Koss et al. (1995) argued, focusing of attention on central aspects of life-threatening events might lead to less well encoded peripheral elements of such experiences.

At the same time, under some circumstances, it appears that traumatic events are forgotten for some period of time. Many retrospective surveys document that adult participants report periods during which they could not recall the traumatic event (e.g., Elliott, 1997; Feldman-Summers & Pope, 1994; Loftus, Polonsky, & Fullilove, 1994). Two prospective investigations of adults with confirmed histories of childhood abuse have found that a substantial percentage appear not to recall their sexual or physical abuse experiences (Widom & Morris, 1997; Widom & Shepard, 1997; Williams, 1994).

Memories for traumatic experiences are not always either too well-remembered or not remembered at all. For example, in a general population survey of women who reported rape, the characteristics of memory for the rape, a negative event, and positive experiences were compared (Koss, Figueredo, Bell, Tharan, & Tromp, 1996). The results revealed that rape memories were hazier, contained less detail, and were less often thought about, than memories for positive experiences. The proposed explanation was that cognitive avoidance strategies were employed to decrease anxiety associated with remembering rape experiences. Similarly, Hyman and Byrne (1999) found that trauma memories in college students were less vivid and contained less sensory detail than memories for positive events. Participants in a prospective study of women with documented sexual abuse histories who reported having a period of not remembering their experiences described their memories as hazier and more doubted despite the fact that they were as consistent with the original event as were the memories of those who had always had recall (Williams, 1997). These studies reveal that trauma may be less clearly remembered despite the presumed salience of these experiences.

The characteristics of children's memory for traumatic experiences have received less attention. Investigations of stressful events such as invasive medical procedures and emergency-room visits for injuries find that the experiences are well remembered by most children (e.g., Goodman et al., 1997; Merritt, Ornstein, & Spicker, 1994). However, children's memory for a real-life punishment experience contained less detail than researcher suggested confabulated experiences (Bruck et al., 1997). In a study comparing the quality of children's memory for a stressful life event with a positive event, investigators found that the children reported different kinds of information about the two types of events (Fivush, Hazzard, Sales, Sarfati, & Brown, 2002). Memories of stressful events included more information about thoughts and emotions, whereas positive events had more descriptive detail.

A few studies have examined children's memories for traumatic events. Terr (1983a, 1983b) found that children who had experienced documented traumatic events, including children who were kidnapped and buried in a bus, have generally accurate memories although they did sometimes make errors of sequencing and time frames and occasionally confabulated elements of the experience. In addition, some very young children exhibited behavioral

reenactments of their experiences as opposed to producing complete verbal narratives (Terr, 1988). A year after a sniper shooting on a school playground, children who were present tended to remember having been farther away, whereas children who were not on the school grounds recalled being present during the shooting (Pynoos & Nader, 1988). Although children recall these experiences well, their memories can be altered.

Memory and Psychological Outcomes

Many of the diagnostic criteria for posttrauma conditions relate to memory. Intrusive, emotionally disturbing memories, flashbacks, nightmares of the event, and amnesia for all or part of the trauma are criteria for posttraumatic stress disorder (PTSD) and acute stress disorder (American Psychological Association [APA], 2000). Dissociative amnesia (APA, 2000) specifically refers to upsetting or traumatic events as producing loss of memory. Brewin, Dalgliesh, and Joseph (1996) have proposed that perceived life threat during the event may serve to enhance conditioned associations and overlearning that produces the sensation of reexperiencing whereas peritraumatic dissociation may lead to less well encoded memories that seem incomplete or vague. Brewin (2001) offers a cognitive neuroscience explanation to elucidate how aspects of trauma memories are sometimes processed in a different way from ordinary autobiographical memories.

Although unusual memory characteristics are considered hallmarks for trauma-specific psychological outcomes, the relationship between memories for abuse and psychological symptoms has been the subject of relatively few investigations. Hyman and Byrne (1999) found no pattern of relationship of psychological symptoms to ratings of characteristics of traumatic memories in college students. Similarly, Koss et al. (1996) reported that with the exception of PTSD symptoms, there were no relationships to psychological or somatic symptoms in adult women.

To date, no studies have compared the nature and characteristics of children's memories for trauma with memories for other events or relationships to psychological symptoms. This study was undertaken to determine whether there are differences between children's memories for trauma as compared to memories for positive events and to establish whether there are relationships between the characteristics of memories for trauma and psychological symptoms. The comparison to a memory for a positive event was selected so that children would choose a memorable experience. While comparison to memory for a negative nontrauma event would have allowed additional comparisons, there were concerns that children might experience undue distress and because young children might have had difficulty completing measures about three separate experiences. On the basis of the extant literature, it was hypothesized that children's memories for traumatic events would be less vivid and less well remembered than their memories for a contemporaneous positive event. Although the adult findings are mixed with regard to the relationship between memory characteristics and psychological symptoms, it was hypothesized that there would be relationships between memory characteristics and intrusive and dissociative symptoms.

Method

The characteristics of children's memories for trauma and positive experiences and relationships between memory characteristics and psychological symptoms were assessed in a sample of children with trauma histories.

Participants

Participants were a convenience sample of 30 children aged 8–16 years with a confirmed history of trauma who were receiving treatment for the effects of these experiences. *Trauma* was defined as an experience meeting the *DSM-IV-TR* (APA, 2000) criteria for a traumatic stressor. The age range was selected because the measure of trauma symptoms used applied to this age group and because children of this age were deemed capable of responding to questions about their memory characteristics.

Measures

Trauma and Positive Events

The trauma for which the children were in therapy was selected as the reference event for the trauma memory because the events had been confirmed through the clinical process, it was known that the children recalled the events, and so that clinicians could provide information about the events. The children selected the positive events and were told to choose a very positive one to increase the likelihood that it was memorable to them. It was specified that the event be one that happened about the same time as the trauma. The accuracy or exact time period for the positive event was not independently confirmed. Children were not required to describe either event, simply to name them. IRB approval was contingent on the children not having to discuss the traumatic event as part of the study.

Demographic and Trauma Characteristics Form

This form assessed the following demographic and descriptive variables: age of child, gender, ethnicity, socioeconomic status (SES), nature of trauma including witness versus participant, single episode versus repeated episodes, relationship of offender, perception of life threat, and the clinical diagnosis. The treating clinician completed this form. The number of treatment sessions was collected from an administrative database.

Children's Memory Characteristics Questionnaire (CMCQ)

This questionnaire included 70 questions about the characteristics and nature of memory for a traumatic event and a "very positive" experience. The questionnaire inquired about characteristics for the memory in general and for a "most clear part of the memory" for both the trauma and the positive event (40 items for the events overall and 30 for the most clear part of the events). Because most of the children had difficulty identifying a most clear part of the memory separate from their basic memory of the event, we were unable to use these 30 items to address possible differences between memory for central and peripheral aspects of the events. There were 20 identical items about memory characteristics for the negative and positive events. Several other items asked about whom the children had talked to about their experiences. The questionnaire was a version of the MCQ developed by Marcia Johnson and her colleagues (Johnson, Foley, Suengas, & Raye, 1988) and modified by Hyman et al. (1998).

Questions addressed the vividness/intensity, sensory qualities, frequency of rehearsal, doubts, feelings, meaningfulness, impact of the memory, and how often it was talked about. Questions were transformed into language thought to be developmentally appropriate and understandable by children with four scaled responses ("My memory has details I can see: none, a little, pretty much, a lot"; "Looking back, what happened turned out to be a big deal: not at all, a little bit, somewhat, definitely").

Children's Memory Characteristics Questionnaire—Therapist Version (CMCQ-Thx)

Thirteen items (of 20 possible) from the CMCQ that might be known to a treating therapist were included (e.g., "Overall, the child's memory for what happened is vivid and/or intense"; "Does s/he have any doubts about the accuracy of his/her memory for what happened"). It also contained items about the children's observed reactions when talking about their experiences (e.g., "Does s/he appear distressed when remembering the event?"; Does s/he resist or avoid discussion of the event when you bring it up?"), how often the experience was discussed in therapy, and whether exposure-type techniques had been used in therapy.

Trauma Symptom Checklist for Children (TSCC; Briere, 1995)

This is a 54-item symptom checklist depending on whether the version containing items about sexual concerns is used. There are six subscales: Depression, Anxiety, Posttraumatic Stress, Dissociation, Anger, and Sexual Concerns. There are two validity scales, hyper- and underresponse. The checklist yields subscale raw and t scores. The clinical cutoff score is set at $t = 65$ for all subscales except sexual concerns where the clinical range is set at above $t = 70$. The measure has well-established reliability and validity.

Procedure

The University of Washington Human Subjects Committee approved procedures and assent and consent forms. Potential participants were children with confirmed trauma histories in therapy at two specialty clinics associated with a university medical center. Therapists were instructed to ask all children between age 8 and 16 currently in therapy if they and their caretakers were willing to be contacted by the research assistant to discuss the study and decide about participation. Time and resource limitations dictated that only 30 children could participate. No children or parents who agreed to discuss the study declined to participate. Therapists were not asked to provide information about all similar-age children in therapy on their caseloads or to confirm that they informed the children about the research project. Once children and their caretakers agreed to be in the study, an appointment was arranged to administer CMCQ. Depending on the children's age and comfort, CMCQ was administered orally or completed by the participant. In one case, because of scheduling problems, CMCQ was completed by phone. Participants and caretakers also agreed to therapist completion of CMCQ-Thx, collection of demographic and trauma characteristics, and the use of results of a TSCC completed within the previous 3 months.

The children were instructed to name the trauma that they were in treatment for and to use that experience for the negative experience and to choose a "very positive"

experience that occurred at about the same time. They were not required to describe the details of either experience as per the Human Subjects approved application. For children whose trauma experiences took place over a period of months or years, the "very positive experience" was to be one that occurred closer in time to the most recent traumatic experience. Older children read and completed the questionnaire, whereas the questionnaire was read to younger children. All children were paid $10.00 for their participation.

Results

Demographic and Descriptive Information

The sample consisted of 20 (67%) girls and 10 boys (33%); 19 (63 %) were Caucasian, 5 (17%) Latino, 3 (10%) African American, 2 (7%) Asian, and 1 (3%) was Native American. SES was estimated to be low (40%), low/moderate (30%), moderate/high (13%), and high (17%) by the therapists. About half of the children were under and half older than 12 years of age at the time of the study.

The traumatic experiences that children had experienced included sexual molestation ($n = 7$, 23%), sexual penetration without force ($n = 9$, 30%), rape ($n = 6$, 20%), nonsexual assault ($n = 1$, 3%), and other trauma (attempted kidnapping, witness to fatal accident; $n = 7$, 23%). In 73% of cases the trauma involved sexual assault. Only 30% involved a single episode. Perceived life threat was rated by therapists as none (43%), some (27%), and a lot (23%). In the large majority of cases (83%) children were victims as opposed to witnesses. All cases involved interpersonal violence; 23% of offenders were parents, 17% other family members, 40% acquaintances, and 20% strangers. The children ranged in age from 3 to 15 years old at the time of the trauma with a mean age of 9.6 years.

The positive experiences were nominated by the children and included a range of types of events. Birthday parties, trips, and special performances were commonly identified. Because the children were not required to describe the events, additional information about them was not available.

The children's clinical diagnoses included PTSD ($n = 5$, 17%), adjustment disorders ($n = 22$, 73%), and other ($n = 3$, 10%). Scores on the TSCC subscales were in the clinical range: anxiety (17%), depression (13%), posttraumatic stress (13%), dissociation (23%), and anger (10%). The children had received between 3 and 105 sessions of treatment, with an average of 38 sessions and a median number of 25 sessions being received. According to therapists' reports, exposure treatment was implemented: not at all (7%), a little bit (23%), quite a bit (43%), and a lot (27%).

Data Analysis

Paired t tests were used for within-participants comparisons of negative and positive memory characteristics. Relationships between memory characteristics and other variables were computed with the Pearson r statistic and independent t tests. Analysis of variance (ANOVA) was conducted to study differences in memory characteristic scales and offender type. Alpha was set at .05.

Trauma Versus Positive Memories

The 20 memory characteristics were scaled to reflect conceptual aspects of memory. A sensory detail/coherence scale was composed of items relating to visual details, vividness, sketchiness, smell, sound, and order resulted in an alpha of .86 for trauma memories and .85 for positive memories. A temporal/spatial scale consisting of items related to what happened before and after and where people and things were produced an alpha of .77 for trauma memories and .66 for positive memories. A scale representing meaning/impact was constructed of items assessing whether the event was a big deal then and now, impact on how the child thinks and feels about self, and how often he/she thought about the trauma. The alpha for both the trauma and the positive event was .62.

Paired samples t tests for trauma and positive memories using the three scales resulted in significant differences for the sensory detail/coherence scale, $t(29) = -3.06$, $p < .01$, and for the impact/meaning scale, $t(29) = 2.39$, $p < .05$. Trauma memories had less sensory detail/coherence than positive memories and more impact/meaning than positive memories. There were no differences between trauma and positive memories for temporal/spatial details.

Items related to memory for feelings at the time, intensity of feelings at the time of the event and now, and emotional valence (negative vs. positive) did not scale. The only item that distinguished trauma and positive events was more negative feelings about the trauma event than about the positive event, $t(29) = 3.5$, $p < .01$.

Therapist Ratings of Children's Trauma Memory Characteristics

There were many significant correlations between therapist ratings of children's trauma memory characteristics and children's reports about their memory

characteristics. However, therapist and child rating correlations were most often for different memory characteristics. Therapist and child ratings for intensity of feelings were correlated at $r(30) = .38$, $p < .05$; whether the memory is a big deal now at $r(30) = .38$, $p < .05$, and doubts about the memory at $r(30) = -.37$, $p < .05$. Child memory characteristics were not associated with therapist ratings of child distress while talking about the trauma, resistance to talking about the trauma, therapist rating of the amount of exposure during treatment, the number of treatment sessions or the diagnosis.

Child Demographic Variables

Associations between child age, gender, ethnicity, SES, and the memory characteristics were examined. Age was associated with the trauma memory sensory detail/coherence scale, $r(30) = .46$, $p < .01$, and the trauma memory meaning/impact scale, $r(30) = .47$, $p < .01$. Older children had more vivid trauma memories and the memories had more meaning. Gender and ethnicity were not associated with memory characteristics for trauma or pleasant memories. Lower income participants had higher mean ratings for the temporal/spatial scale for positive memories, $t(28) = 2.77$, $p < .01$.

Trauma Characteristics

Results indicated that memory characteristics were affected by the type of trauma experienced, with sexual versus nonsexual traumas having lower mean ratings for the trauma memory sensory detail/coherence scale, $t(29) = -2.47$, $p < .05$. The presence of perceived life threat was associated with higher mean levels on the sensory detail/coherence scale, $t(29) = -2.65$, $p < .01$. Offender relationship was significantly associated with mean ratings for the impact/meaning scale for the trauma, $F(3, 26) = 9.93$, $p < .001$), with victims of parent offenders reporting less impact than victims of other family members, acquaintances, or strangers. Duration of trauma (single incident vs. multiple incidents) and time since trauma were not associated with memory characteristics.

Psychological Variables

The only significant relationship between the three memory characteristics scales and psychological symptoms was for the impact/meaning scale and the Posttraumatic Stress scale of the Trauma Symptom Checklist for Children. The only significant relationship between talking about the trauma with others and memory characteristics was that higher mean ratings for the impact/meaning scale was associated with talking to friends.

Discussion

The results of this study support the hypothesis that children's memories for trauma have less sensory detail and are less coherent than memories for positive events. These findings are consistent with those reported by Koss et al. (1996) and Hyman and Byrne (1999) for adults and Fivush et al. (2002) for children. One possible explanation is that elements of traumatic experiences are not encoded or are shallowly encoded. This may occur because attention is diverted from the specific components of the events during the trauma. As proposed by Fivush et al. (2002), children may attend more to negative internal states than to what is actually happening. Or they may be disconnecting from the event by pretending it is not happening or focusing on something other than the acts taking place when it is happening.

Alternatively, incomplete or inadequate retrieval processes may account for these differences. Koss et al. (1996) implicates cognitive avoidance strategies that are employed to decrease the anxiety that is associated with disturbing emotional memories. If children engage in active efforts to push memories away and do not think about their experiences, over time this coping style may lead to hazier, less vivid memories.

These results suggest that the validity of trauma experiences should not be judged on the basis of vividness or coherence. In fact, just the opposite may be true in many cases. Like those of Bruck et al. (1997), the findings reveal that fewer details are associated with trauma memories.

The findings demonstrate that the emotional valence is more negative and the meaning/impact more significant for trauma memories than for positive memories. That the trauma memories were more negative is not surprising. The children experienced events that would be clearly considered potentially traumatic. The fact that all of the children had reported the experiences and that their parents were concerned enough to bring them to therapy as a result would likely make these trauma memories a "bigger deal" and more important in determining self-perceptions than positive experiences.

Some of the differences are accounted for by children's age. Older children tended to have memories with more sensory detail/coherence and more impact/meaning, but only for trauma not positive experiences. This suggests that trauma memories may have unexpected

characteristics, but more so for younger children. In addition, for developmental reasons, older children may be more likely to evaluate and process the meaning of experiences as they relate to identity and self-perception.

The type of trauma appeared to make some difference in the characteristics of memories; sexual trauma was less vivid and coherent, although this may be accounted for by the fact that sexual traumas were more likely to involve multiple incidents. It is interesting to note that victims of traumas committed by parents reported less impact/meaning. This finding may reflect a suppression of reactions or use of more avoidance coping. This possibility is supported by research showing that girls who are sexually maltreated by father figures report inhibiting their emotions with their fathers in emotionally arousing situations in order to avoid interpersonal conflict (Shipman, Zeman, Fitzgerald, & Swisher, in press). Stranger traumas were more talked about with friends, perhaps because children were less conflicted or ambivalent about the experiences.

As predicted there was a relationship between trauma memory characteristics and psychological symptoms, however this association held only for the impact/meaning component of the memories, not for the sensory component. For this sample, intrusive symptoms were related to more cognitive processes. Contrary to hypothesis, there was no relationship between trauma memory characteristics and dissociation. These results are generally consistent with other findings that there is no consistent relationship between memory characteristics and psychological outcomes (Hyman & Byrne, 1999; Koss et al., 1997). The sample size and the fact that few children had clinically significant levels of symptoms or were diagnosed with PTSD may have attenuated any potential relationships as well.

At the same time, it is clear that trauma memories and memories for positive events are more similar than not. For most items, when individual items were compared, there were no differences between the two types of memories. This means that memories for presumably memorable experiences, whether positive or negative, share many features. In general, inspection of the means reveals that both types of memories are rated as being detailed, coherent, and having relatively intense emotional valence.

The results of this study are only suggestive. The sample size was small and included children with a range of disparate types of trauma experiences that had occurred at varying periods in the past. Despite the fact that it was a clinical sample, the low levels of clinically significant distress in the children may also make it unrepresentative of children seen soon after a traumatic event and before therapy. In addition the two events were not necessarily comparable in salience or characteristics. The researchers selected the trauma event, whereas the children chose the positive event. There was no independent verification of the time when the positive event took place and whether it corresponded with the most recent trauma event. Many of the traumas were multiple events whereas the positive experiences were generally one-time events.

Several problems with the measure surfaced during administration. For example, many children did not understand the meaning of the term *vivid* even when efforts were made to explain it (e.g., strong, clear). Children also had difficulty with the term *intense* as a descriptor for feelings.

In conclusion, children rated their memories for traumatic experiences as less clear and detailed than very positive experiences. Nonetheless, they rated the traumatic experiences as more important. Further, for many ratings there were no differences between traumatic and positive experience. The observed differences most likely reflect either poorer encoding of traumatic events originally or less processing and rehearsal after the events. There are few relationships between trauma memory characteristics and posttrauma symptoms.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., Text Rev.). Washington, DC: Author.

Berliner, L., & Briere, J. (1997). Trauma, memory and clinical practice. In L. M. Williams & V. L. Banyard (Eds.), *Trauma & memory* (pp. 3–18). Thousand Oaks, CA: Sage.

Brewin, C. (2001). A cognitive neuroscience account of posttraumatic stress disorder and its treatment. *Behavior Research and Therapy, 39,* 373–393.

Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review, 103,* 670–686.

Briere, J. (1995). *Professional manual for the Trauma Symptom Checklist for Children (TSCC).* Odessa, FL: Psychological Assessment Resources.

Bruck, M., Hembrooke, H., & Ceci, S. (1997). Children's reports of pleasant and unpleasant events. In D. Read & S. Lindsay (Eds.), *Recollections of trauma: Scientific evidence and clinical practice* (pp. 199–219). New York: Plenum Press.

Cahill, L., & McGaugh, J. L. (1998). Mechanisms of emotional arousal and lasting declarative memory. *Trends in Neurosciences, 21,* 294–299.

Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: An historical review and synthesis. *Psychological Bulletin, 113,* 403–439.

Ceci, S. J., & Friedman, R. D. (2000). The suggestibility of children: Scientific research and legal implications. *Cornell Law Review, 86,* 33–108.

Elliott, D. M. (1997). Traumatic events: Prevalence and delayed recall in the general population. *Journal of Consulting and Clinical Psychology, 65,* 811–820.

Elliott, D. M., & Briere, J. (1994). Forensic sexual abuse evaluations of older children: Disclosures and symptomatology. *Behavioral Sciences and the Law, 12,* 261–277.

Feldman-Summers, S., & Pope, K. S. (1994). The experience of forgetting childhood abuse: A national survey of psychologists. *Journal of Clinical & Consulting Psychology, 62,* 636–639.

Fivush, R. (1993). Developmental perspectives on autobiographical recall. In G. S. Goodman & B. L. Bottoms (Eds.), *Child victims, child witnesses* (pp. 1–24). New York: Guilford.

Fivush, R., Hazzard, A., Sales, J. M., Sarfati, D., & Brown, T. (2002). Creating coherence out of chaos? Children's narratives of emotionally negative and positive events. *Applied Cognitive Psychology, 16,* 1–19.

Goodman, G. S., Rudy, L., Bottoms, B. L., & Aman, C. (1990). Children's concerns and memory: Ecological issues in the study of children's eyewitness testimony. In R. Fivush & J. Hudson (Eds.), *Knowing and remembering in young children* (pp. 249–284). New York: Cambridge University Press.

Goodman, G. S., Quas, J. A., Batterman-Faunce, J. M., Riddlesberger, M. M., & Kuhn, J. (1997). Children's reactions to and memory for a stressful event: Influences of age, anatomical dolls, knowledge, and parental attachment. *Applied Developmental Science, 1,* 54–75.

Hyman, I. E., Jr., & Byrne, C. A. (1999, July). *Differences between trauma memories and memories of other experiences.* Paper presented at the meeting of SARMAC: Society for Applied Research in Memory and Cognition, Boulder, CO.

Hyman, I. E., Jr., Gilstrap, L. L., Decker, K., & Wilkinson, C. (1998). Manipulating remember and know judgments of autobiographical memories: An investigation of false memory creation. *Applied Cognitive Psychology, 12,* 371–386.

Hyman, I. E., Jr., Husband, T. H., & Billings, F. J. (1995). False memories of childhood experiences. *Applied Cognitive Psychology, 9,* 181–197.

Hyman, I. E., Jr., & Pentland, J. (1996). The role of mental imagery in the creation of false childhood memories. *Journal of Memory and Language, 35,* 101–117.

Johnson, M. K., Foley, M. A., Suengas, A. G., & Raye, C. L. (1988). Phenomenal characteristics of memories for perceived and imagined autobiographical events. *Journal of Experimental Psychology: General, 117,* 371–376.

Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin, 114,* 3–28.

Koss, M. P., Tromp, S., & Tharan, M. (1995). Traumatic memories: Empirical foundations, forensic and clinical implications. *Clinical psychology: Science and Practice, 2,* 111–132.

Koss, M. P., Figueredo, A. J., Bell, I., Tharan, M., & Tromp, S. (1996). Traumatic memory characteristics: A cross-validated mediational model of response to rape among employed women. *Journal of Abnormal Psychology, 105,* 421–432.

Lamb, M. E., Sternberg, K. J., Esplin, P. W., Hershkowitz, I., & Orbach, Y. (1997). Assessing the credibility of children's allegations of sexual abuse: A survey of recent research. *Learning and Individual Differences, 9,* 175–194.

Lawson, L., & Chaffin, M. (1992). False negatives in sexual abuse disclosure interviews: Incidence and influence of caretaker's belief in abuse in cases of accidental abuse discovery by diagnosis of STD. *Journal of Interpersonal Violence, 7,* 532–542.

LeDoux, J. E. (1994, June). Emotion, memory and the brain. *Scientific American, 270,* 50–57.

Lindsay, D. S. (1993). Eyewitness suggestibility. *Current Directions in Psychological Science, 2,* 86–89.

Loftus, E. F., Polonsky, S., & Fullilove, M. T. (1994). Memories of childhood sexual abuse: Remembering and repressing. *Psychology of Women Quarterly, 18,* 67–84.

Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals, 25,* 720–725.

Merritt, K. A., Ornstein, P. A., & Spicker, B. (1994). Children's memory for a salient medical procedure: Implications for testimony. *Pediatrics, 94,* 17–23.

Pynoos, R., & Nader, K. (1988). Children's memory and proximity to violence. *Journal of the American Academy of Child and Adolescent Psychiatry, 27,* 567–572.

Quas, J., Qin, J., Schaaf, J. M., & Goodman (1997). Individual differences in children's and adults' suggestibility and false event memory. *Learning and Individual Differences, 9,* 359–390.

Ruby, C. L., & Brigham, J. C. (1997). The usefulness of the criteria-based content analysis technique in distinguishing between truthful and fabricated allegations. *Psychology, Public Policy and Law, 3,* 705–737.

Sauzier, M. (1989). Disclosure of child sexual abuse: For better or worse. *Psychiatric Clinics of North America, 12,* 455–469.

Shipman, K., Zeman, J., Fitzgerald, M., & Swisher, L. (in press). Regulating emotion in parent–child and peer relationships: A comparison of sexually maltreated and nonmaltreated girls. *Child Maltreatment.*

Terr, L. (1988). What happens to early memories of trauma? A study of twenty children under age five at the time of the documented traumatic events. *Journal of the American Academy of Child and Adolescent Psychiatry, 27,* 96–104.

Terr, L. (1983a). Chowchilla revisited: The effects of psychic trauma four years after a school bus kidnapping. *American Journal of Psychiatry,* 140, 1543–1550.

Terr, L. (1983b). Time sense following psychic trauma: A clinical study of ten adults and twenty children. *American Journal of Orthopsychiatry, 53,* 244–261.

van der Kolk, B. A. (1994), January/February. The body keeps the score: Memory and the evolving psychobiology of posttraumatic stress. *Harvard Review of Psychiatry, 1,* 253–265.

Widom, C. S., & Shepard, R. L. (1996). Accuracy of adult recollections of childhood victimization: Part 1. Childhood physical abuse. *Psychological Assessment, 8,* 412–421.

Widom, C. S., & Morris, S. (1997). Accuracy of adult recollections of childhood victimization: Part II: Childhood sexual abuse. *Psychological Assessment, 9,* 34–46.

Williams, L. (1994). Recall of childhood trauma: A prospective study of women's memories of child sexual abuse. *Journal of Consulting and Clinical Psychology, 62,* 1167–1176.

Williams, L. M. (1997). Recovered memories of abuse in women with documented child sexual victimization histories. *Journal of Traumatic Stress, 8,* 649–673.