Children’s recollections of traumatic and nontraumatic events

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Abstract
Whereas the social and emotional consequences of childhood trauma are well documented, less is known about how young children understand, represent, and remember traumatic experiences. A review of the literature indicates striking similarities in the development of young children’s ability to recall traumatic and nontraumatic events. More specifically, events experienced before the age of about 18 months do not seem to be verbally accessible; events experienced between about 18 months and 2.5–3 years are reported in fragmentary fashion and seem to be prone to increasing error over time. From about age 3 years on, children can give reasonably coherent accounts of their past experiences and can retain these memories over long durations. The ways in which children are able to participate in conversations about events as they are occurring and in retrospect seems to play a critical role in their developing event memories. Implications of the empirical data for understanding trauma memory in childhood are discussed.

Statistics from both clinical and community samples indicate that one out of four individuals in our culture experience trauma as a child (Brewin, Andrews, & Gotlieb, 1993; Elliot, 1996). Given these epidemic proportions, surprisingly little developmental research has focused on how children understand traumatic experiences. Although there is considerable evidence that severe trauma often leads to socioemotional difficulties (Beitchmen, Zucker, Hood, daCosta, Ackman, & Cassavia, 1992; Briere & Elliot, 1994), the processes by which some children are able to cope with even quite severe trauma are mostly unknown. In this review, I will argue that a critical piece of this puzzle relies on the ways in which young children are able to make sense out of their traumatic experiences, and this process, in turn, relies on how children come to represent, interpret, and remember trauma.

In the first section of this paper, I review the literature on the development of event memory. Although this research focuses on children’s developing memories of everyday and/or positively valenced events, it provides a framework for understanding the development of memory in general, within which memory for trauma must be placed. I then turn to the clinical literature describing case studies of severely traumatized children. This research provides the richest information on memory of trauma, but obviously lacks certain experimental controls. In the third section, I turn to the small but growing body of experimental research on children’s memories for stressful experiences. In trying to integrate findings across these three areas, several issues emerge as critical in the study of trauma memory, and I draw these out in the final section, along with recommendations for future research. Throughout, developmental differences are highlighted, and, in particular, the ways in which developing language skills interact with the development of event memory are discussed.

Before beginning, it is necessary to point out that, although I use the term “trauma” throughout this paper, there is no agreed upon definition of trauma or stress in the literature.
The DSM-IV provides a definition of trauma that focuses on threat of death or injury, or the witnessing of death or severe injury (American Psychiatric Association, 1994), but this definition is only loosely used in the clinical literature and is not referred to at all in the experimental literature. Moreover, many of the “stressful” experiences studied in the experimental literature are quite mild (e.g., an inoculation, a broken bone) compared to the extreme stress children are too often exposed to in their everyday lives (e.g., witnessing the brutal murder of a parent, being repeatedly raped by one’s father). Further, the DSM-IV definition highlights threat to one’s physical integrity, rather than emotional integrity. As several theorists have argued, emotional betrayal may be at the core of traumatic experience (Freyd, 1996; Shay, 1996).

Related to this idea is the issue of the causal explanation of the traumatic experience. Whereas natural disasters may cause a great deal of stress, they are understood in very different ways than are events perpetrated by human agents, such as abuse, rape and torture. Natural disasters will not be as prone to lead the victim to self-blame, nor do natural disasters lead to shame, guilt, and secrecy to the same extent as traumas perpetrated by others. Even within traumas perpetrated by others, the relationship between the victim and the perpetrator plays an important role. Witnessing violence committed by strangers in the community may be different than witnessing domestic violence within one’s own home (see Cicchetti, Toth, & Lynch, 1997, for a full theoretical discussion of how different types of traumas may lead to different child outcomes). While it is obviously beyond the scope of this review to provide a viable definition of either trauma or stress, this remains a thorny issue in the field and often makes it difficult to compare across the clinical and experimental literatures.

Finally, I want to emphasize that, because this review focuses on the ways in which children represent and recollect trauma, I am focusing on verbal recall of experience. Although experiences may leave many markers, including changes in behavior and personal-
Children’s recollections

Reports are generalized and temporally structured. From age 3 years on, children report what commonly occurs across specific experiences of an event (e.g., “You get a happy meal and you eat it and go home” when reporting going to McDonald’s) rather than specifying what happened during one specific experience at McDonald’s) and children report events in the timeless present tense, indicating a general routine rather than a specific occurrence. Further, children virtually always report the component actions of events in their correct temporal order. The form of children’s verbal reports conform to a “script” model, in which events are organized as spatially temporally organized frameworks that specify which actions are most and least likely to occur during any given experience of a recurring event (Schank & Abelson, 1977; see Fivush, 1997, and Nelson, 1986, for reviews of the developmental research).

That even quite young children report familiar events as scripts indicates that they are able to abstract commonalities across their experiences. But how well can young children recall one specific experience? Novel events, events that occur only once and remain relatively distinctive in a child’s experience, seem to be quite well recalled by preschoolers. By age 3, children are able to give accurate detailed reports of specific events such as visits to museums, amusements parks, airplane rides, etc., that they have experienced only once (Fivush, Gray, & Fromhoff, 1987; Hammond & Fivush, 1990; Hudson & Nelson, 1986; Todd & Perlmuter, 1980; see Fivush, 1993, for a review). Most impressive, children’s event memories endure over long periods of time. For example, children who went to Disney World when they were between the ages of 2.5 and 4.5 years were still able to give extremely accurate and detailed accounts of their experiences 18 months later (Hammond & Fivush). And Fivush and Schwarzmuller (1998) found that children interviewed about novel events at age 3 were still able to recall these events accurately 5 years later when they were 8 years old. Obviously there is forgetting over time, and there is also some indication of increased error with increasing retention intervals (Hudson & Fivush, 1991; Poole & White, 1993), but the data indicate remarkable abilities to remember distinctive events across the preschool years.

However, a different pattern emerges when we examine preschooler’s ability to recall a single episode of a repeated event. As do adults (Graesser, Woll, Kowalski, & Smith, 1980), children have great difficulty recalling one time that they went to McDonald’s, or what happened on a specific day at school (Fivush, 1984; Hudson & Nelson, 1983; see Hudson, Fivush, & Kuebli, 1992, for a review). Unless the particular episode deviates in a substantial way from what usually happens, children have great difficulty reporting a specific instance (Davidson & Hoe, 1993; Hudson, 1990a). Moreover, preschoolers seem to have more difficulty separating specific instances of a repeated event than do older children and adults. Three- and 4-year-old children are especially likely to confuse details among repeated experiences (Farrar & Goodman, 1990). In fact, after experiencing a particular event just a few times, 3- and 4-year-old children are quite likely to report only those actions that occur across occurrences and to omit any actions that occurred during only one occurrence of the event (Bauer & Fivush, 1992; Hudson, 1990a; Hudson & Nelson, 1983; Kuebli & Fivush, 1994).

These patterns indicate that young children may be better able to report the details of a single distinctive experience than a single episode of a repeated event. An event that remains distinctive in the child’s experience also remains memorable; children are able to recall these kinds of events in surprising detail even after long delays. But when recalling a repeated event children’s reports are more general, focusing on what usually happens. Details of specific experiences are omitted or confused among episodes. It is in this sense that memory is reconstructive; when children (and adults) have multiple experiences that are similar, the memory representation becomes more generalized, and what happened during any specific occurrence is reconstructed from this more general knowledge. Although these script reports are still accu-
rate, in the sense that they describe what usually happens when this event occurs, they are lacking in detail, and may not be completely accurate to any one instance of the event.

Thus, by 3 years of age children are able to report verbally both repeated experiences and distinctive experiences, although these reports differ in their specificity. What about children younger than age 3 years? How do children report events as they are just becoming able to talk about the past, and, most intriguing, are children able to verbally recall events that occurred before they could talk at all?

The development of verbal recall

Children begin to refer to past events linguistically at about 20 months of age (Eisenberg, 1985; Sachs, 1983), although their references are quite attenuated. Virtually all past references at this early age are to just completed or very recent events, and are most often in direct response to an adult’s comments. Frequently, children at this age simply confirm or repeat an adult’s recollection, or give a one word response to a direct question. Within a few months, children’s abilities to refer to the past develop dramatically, and between the ages of about 2.5 and 3 years children become able to give reasonably coherent verbal accounts of past experiences (Eisenberg; Fivush et al., 1987). However, young children are still dependent on adults to help them structure their recall; they provide information in response to direct questions about what occurred. Over the course of the preschool years, children become less and less dependent on adults’ questions to help them recall (see Pillemer & White, 1989, for a review). Essentially, children become more competent narrators about their past experiences, becoming better able to provide a full account of what occurred without specific prompts to do so. However, although younger children need more cues and prompts in order to provide information and even with prompts usually provide less information than older children, what young children do recall is quite accurate, at least in the absence of suggestive or misleading questions.

There is also evidence that children are able to recall events from this period of time even as they grow older. Fivush et al. (1987) demonstrated that children not quite 3 years old were able to report accurately details of experiences that occurred up to 10 months in the past, and Todd and Perlmutter (1980) report that 3-year-olds could accurately recall events that occurred well before their third birthday. However, there does seem to be a lower limit beyond which children do not seem able to recall verbally. Boyer, Barron, and Farrar (1994) found that children who experienced a specific play event when they were 20 months of age were able to reenact the event when they returned to the laboratory playroom more than a year later, but there was little evidence of verbal recall of the event. Similarly, Myers, Perris, and Speaker (1994) followed children over several years to assess their memory for a single experience that occurred at 10 or 14 months of age. Although there was some evidence of behavioral memory of the event, in that children who had experienced the original event showed more interest in the objects used than did children who had not experienced the event, there was virtually no evidence of explicit recall of the event, either through reenacting what had occurred or through verbal report.

In the most comprehensive study of this issue, Bauer and Wewerka (1997) examined children’s memory for a series of specific action sequences learned when they were 20 months of age. Memory was assessed after a 1-year delay both behaviorally, in the form of reenactment of the sequences, and verbally. Overall, children recalled the sequences in action. But only those children who were linguistically more sophisticated at the time of the initial experience were subsequently able to recall the event verbally. The patterns suggest that the ability to recall an event verbally may depend on the ability to verbally describe the event at time of experience. Events which occur before sufficient verbal skills develop may not become available for verbal recall even as children develop the language skills necessary for describing that event. Further, 20 to 24 months of age seems to be the average age at which children are able to describe
events as they are occurring, as well as the average age at which children begin to refer to very recent past events in language. Of course, given the wide individual differences in language skills, this average age must be interpreted with great caution. As Bauer and Wewerka have demonstrated, it is the language skills that predict subsequent verbal recall and not the age of the child.

It is important to point out that even well before the development of language skills, children are able to retain fairly explicit memories of specific events. Bauer and her colleagues (see Bauer, 1996, 1997, for reviews) have demonstrated that 12- to 13-month-olds can easily learn a sequence of actions performed on a set of novel objects, and, more impressive, when these children return to the laboratory many months later, they still show evidence of recalling the previously learned event sequences. However, these children do not seem to be able to describe these events verbally as they get older. Thus the argument is that there is something special about being able to describe an event verbally as it is occurring that allows for a different kind of representation, one that remains verbally accessible over time.

The role of language in event memory

What is it about being able to verbally describe an event as it is occurring, even in a limited way, that allows for later verbal recall? Memories of experienced events must be encoded in multiple modalities, including sensory and visual images, but these memories do not seem to be “translatable” into language if they occurred in the first 1.5–2 years of life. At the simplest level, it may be that events must be encoded linguistically in order to be recalled in language. But this only leads to the question of how language changes the memory representation. Following from Vygotskian theory (1978), language can be conceptualized as a tool that allows children to organize experiences in a new way. Most important, language allows children to share their memories with others in a way that is not possible outside of language. Once children have even rudimentary language skills to describe their experiences, they are able to communicate with others about those experiences, even if they can only provide bits and pieces of memory. Essentially, it is discussing experiences with others that leads to more coherently organized memories which remain accessible and verbalizable over time (see Fivush, Haden, & Reese, 1996; and Nelson, 1993, 1996, for related arguments).

Two lines of evidence support this theoretical speculation. First, the way in which events are talked about as they are occurring has a profound influence on the way in which children subsequently recall that event. Tessler and Nelson (1994) found that when recalling a visit to a museum, or a photo-taking excursion, 4-year-old children recalled those aspects of the event that were mutually discussed by mother and child during the event. Information commented on only by the mother, or even only by the child, tended not to be recalled. So it is not simply what is noticed, or even what is labeled during the event that is critical; rather it is what is jointly constructed through conversations that the child recalls. Recent research by Haden, Didow, Ornstein, and Eckerman (1997) demonstrated the same effect with 2.5-year-olds.

When jointly discussing aspects of an event, the mother and child are essentially creating an extended narrative about what is happening, and this may be what helps organize the event for the child. In an innovative study, Pipe, Dean, Canning, and Murachver (1996) asked 5-year-old children to play “pirate.” Half of the children experienced the event with full narration (e.g., “Now we are going to make the magic treasure map. First we have to mix these colors . . .,” etc.) and half the children experienced exactly the same event but with “empty” language (e.g., “Now we’re going to do this”). Children’s memories for the experience were assessed both through reenactment and verbal recall. Not surprisingly, children experiencing full narration during the event subsequently reported the experience more accurately, more fully, and in a more organized way than did children who experienced only empty language. But intriguingly these same effects held for reenactment of the event, suggesting that the
presence of narration helped children form a more organized representation of the experience.

It is not just how an event is talked about as it is occurring that is important; the way in which an event is talked about in retrospect also has an effect. Certainly, young children need a great deal of support from adults, in the form of questions and cues, in order to verbally report their past experiences. The more structure an adult can provide for the young child, the more the child is able to report. Moreover, parents who discuss past events with their preschool children in more detailed and narratively coherent ways have children who come to report their experiences in more detailed and narratively coherent ways (Fivush, 1991; Haden, Haine, & Fivush, 1997; McCabe & Peterson, 1991; Reese, Haden, & Fivush, 1993), indicating that children are learning how to recall their experiences through participating in adult-guided conversations about past events. Interestingly, in the Pipe et al. (1996) study described above, some children experienced the event without narration, but after the experience, they were read a story about playing pirate that essentially provided the missing narrative. Children in this condition recalled the event in the same way as children who participated in the narrated event, indicating that children were able to use the subsequent narration to help them organize the experience after it occurred.

As children engage in narratively organized conversations about events, both as they are occurring and in retrospect, they come to represent their experiences in more coherent ways. Young children seem to be at least somewhat dependent on adults to help them organize their experiences in these ways, but it is children’s developing language skills that allows them to engage in these conversations in the first place. The argument, then, is not that language per se leads to a different kind of memory representation, but rather that language provides a new tool allowing children to engage with others in a new way, and this, in turn, allows children to take advantage of the structure provided by adults to help them understand and organize their experiences more coherently. Events that occur before children develop this ability may be remembered in behavior, but the ability to provide a verbal account of an event seems to depend on at least a rudimentary ability to engage in these kinds of conversations when the event is first experienced.

In summary, it is clear that preschool children have accurate, detailed memories of specific experiences and that they can retain these memories over extended periods of time. However, as events are repeated, the representations become more general and details are lost or confused among episodes. Two-year-olds also seem to have accurate memories of past experiences, although their verbal reports are much sparser than older children’s. Most provocative, it seems that events occurring before the age of about 20 months may never become accessible for verbal report. As children develop the language skills for engaging in conversations about events as they are occurring and in retrospect, they seem to be developing new ways of representing events that allow for subsequent verbal recall. The question of central interest for this review, of course, is whether memory for traumatic experiences follows this same developmental trajectory.

Clinical Studies of Real-World Trauma Memories

Paradoxically, there are two “common-sense” beliefs about trauma memory. On the one hand, it is argued that trauma is so shocking that it is essentially “burned into the brain.” Traumatic experiences are retained in all too vivid detail, never to be forgotten. On the other hand, it is also believed that trauma is so overwhelming that one cannot process it, or cope with it, and therefore, trauma memories are pushed aside (repressed, as it were)

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1. Note, however, that we also know from the large literature on suggestibility that post-event narration that misconstrues what actually happened may have detrimental effects on children’s subsequent recall (see Ceci & Bruck, 1993, for a review). Thus the way in which the event is discussed in retrospect can either help or hinder children’s event memory, depending on the information provided by the conversational partner.
removing difficult to bring to mind. Terr (1991) has integrated these folk theories of trauma, and has argued that there are two types of trauma, Type I and Type II. Type I trauma is a single shocking event. Although it may be extended in time, such as the Chawchilla kidnapping in which children were abducted on their school bus and buried alive overnight, the event is a single occurrence. In contrast, Type II trauma is repeated, or chronic traumatic experiences, such as multiple instances of physical or sexual abuse occurring over a period of weeks or years. Terr argues that Type I trauma leads to vivid, accurate memory, whereas Type II trauma leads to patchy or even non-existent memories. The reasoning is that in order to cope with repeated trauma, children begin to dissociate, or distance themselves from the experience as it is occurring. Dissociation during the experience leads to poorer encoding, and thus poorer memory. But notice that this argument implies that the memories are not "recoverable" as information never initially encoded obviously cannot be retrieved.

Terr brings two types of evidence to bear on this theory. First, the clinical literature is rife with examples of young children displaying vivid recall of single traumatic experiences (which will be discussed in more detail below). Second, there has been an overwhelming number of individuals who, as adults, claim to recall histories of repeated childhood sexual abuse that they had previously repressed or forgotten. The problem with this argument is twofold: first, it is not clear how to interpret "recovered" memories (see recent reviews by Conway, 1997, and Pezdek & Banks, 1996). Second, and more germane to this paper, there is no evidence that children themselves are unable to recall repeated experiences of trauma, as Terr’s theory suggests. However, it must also be noted that little research has examined children’s memories of repeated stressful experiences. Rather, the clinical literature has focused on children’s memories of single instances of trauma.

Virtually all the case studies presented indicate that children, at least those age 3 or older at time of experience, are able to recall a single traumatic experience in vivid detail (Pynoos & Nader, 1989; Malmquist, 1986; Terr, 1983, 1988; see Reviere, 1996, for a review). In a seminal study, Terr (1988) described 20 case studies of children between the ages of 1 and 5 years when they experienced a traumatic event, ranging from a dog bite to an evisceration. All children showed evidence of remembering the trauma in their behaviors, such as expressing specific fears, but children below the age of about 18 months when the trauma occurred were unable to express any verbal memory. Children between 18 and about 28 to 36 months at time of trauma could subsequently give fragmented, “spotty” verbal accounts; only those children older than about 2.5–3 years at time of experience were able to give a complete verbal account of the trauma. This pattern suggests that children’s verbal ability at the time of experience is a critical factor in their subsequent ability to recall the experience verbally.

This conclusion is complicated somewhat by case studies reported by Hewitt (1994) and Gaensbauer (1995). Hewitt describes one young girl who experienced a single incident of sexual abuse when she was 2 years 7 months but did not disclose it until she was 4 years old and was then able to describe it in detail. Because the incident was not known to the parents, the child had never been asked to recall this experience before the spontaneous disclosure; given the child’s age, it is quite likely that she would have been able to report it verbally even at time of occurrence. What is remarkable is that she was able to retain this memory over this period of time even though she had never discussed it with anyone. The second case study reported by Hewitt is more surprising. This child was sexually abused by her grandfather when she was 2 years 1 month of age. At 2 years 3 months she was referred for therapy and, although she could talk about other past experiences, was unresponsive when questioned about the abuse. When she was 6 years old, she began to display overly aggressive behavior and when referred back for therapy now gave a verbal account of her earlier sexual abuse. However, two things need to be considered in evaluating this case description. First, this
child was obviously quite verbal as she was able to describe other past experiences when in therapy at 2 years 3 months, so her lack of verbal report of the abuse experience may have been due to reluctance rather than inability to express it verbally. Second, the parents brought her to therapy because they knew she had been abused, and it is quite possible that they spoke with her about this experience in the intervening years, which obviously makes interpretation of the later verbal report difficult.

The most compelling evidence of a preverbal experience being verbally reported later in development is a case study described by Gaensbauer (1995). This child witnessed her mother being blown to pieces by a letter bomb when she was 12 months of age. When she was 3 years old she described isolated details of what she had seen, albeit in a fragmentary way, to her foster mother. Critically, her foster mother did not know any of these details. Thus it seems that some aspects of preverbal experiences may become accessible for verbal recall, but this translation seems limited to describing unconnected bits and pieces of sensory images. While this case study provides provocative data, the bulk of the evidence from the clinical literature suggests that experiences occurring before the age of about 18 months do not become accessible for verbal recall. Experiences between about 18 months and 2.5–3 years can be verbally recalled but this recall is fragmentary. Children older than 2.5–3 years at time of experience remain able to report their traumatic experience in a reasonably coherent narrative over extended periods of time. Intriguingly, this is the same developmental pattern that emerges from children’s memories of everyday events discussed earlier.

It is important to stress that I am not arguing that trauma memories (or any memories for that matter) are totally accurate. All memory is at least partly reconstructive and all memories seem to contain at least some error. However, just because a memory report is partly reconstructed from general knowledge does not mean that it is in error; general event schemas are so powerful exactly because they allow us to remember and to predict so accurately. We use our general knowledge about the world to reconstruct what must have happened during this one experience, either by tagging this experience as typical or atypical. That is, some experiences conform to the way things “usually” happen and thus are remembered in this way, whereas other experiences are remembered as distinct in particular ways, and it is these distinctive aspects that make the specific event particularly memorable. Either way, the specific event may be recalled quite well as a conglomeration of general and specific event knowledge. Indeed, autobiographical memories are usually highly accurate both in adults (Brewer, 1988; Conway, 1995; Neisser et al., 1996; Wagenaar & Groeneweg, 1990) and children (see Fivush, 1993, for a review).

As are more mundane memories, trauma memories are not completely accurate either. For example Pynoos and Nader (1989) examined children’s memories of a sniper attack at their school and found that children seriously misjudged where they were when the attack began. Children close to the line of fire placed themselves further away, while children further away tended to place themselves closer. Pynoos and Nader interpret this as the children’s need to place themselves spatially in a place that matched their emotional experience—those too close needed to distance themselves whereas those far away needed to express how close to danger they felt. Similarly, Terr (1983) reports that children kidnapped from their school bus and buried alive overnight were able to recall much of the event in vivid detail 4 years later, but there was evidence of error as well. Some children were confused about the chronology of certain events of the day, and one child misremembered one of the kidnappers as being black, when in reality both kidnappers were white. In reviewing the clinical literature, Pynoos, Steinberg, and Aronson (1997) further argue that children may sometimes include fantasies about resolution in their reports of trauma, which may be a useful coping strategy but obviously compromises the memory report.

The fact that trauma memories do contain some error indicates that traumatic experiences are not “burned into the brain,” but that
they follow some of the same processes that have been documented for more everyday kinds of memories. The question is whether memories for traumatic and/or stressful events are more or less accurate than non-stressful experiences. From the clinical literature, it is difficult to answer this question, both because children’s memories of traumatic experiences are not directly compared to their memories for nontraumatic experiences and because the actual event being recalled is often unknown to the interviewer. More experimentally controlled studies allow a more systematic answer to this question.

Experimental Studies of Memory for Stressful Events

Within the adult literature, there has been substantial investigation of the role of arousal on memory (see Christianson, 1992, for a review). Following from the Yerkes–Dodson law, it was hypothesized that moderate levels of arousal would lead to increased attention and therefore better memory than low levels of arousal. However, as arousal increased to high levels, it would disrupt the system, leading to poorer attention and encoding and thus poorer memory. Hence, an inverted U-shaped function was predicted. Although some research supported such a memory function, the majority of research suggests that increased arousal leads to increased memorability. But this conclusion must be taken with great caution. Research with adults has focused on participants’ memories for video displays of emotionally disturbing events, such as car crashes or scenes from horror movies, viewed in a laboratory setting. Although these presentations may lead to increased levels of arousal, they are certainly not commensurate with the level of arousal that would be experienced in a truly traumatic event. Thus it is possible that at extreme levels of arousal, memory would decline.

Research with children has taken a more ecologically valid form. Early investigations manipulated children’s arousal in experimental situations. For example, Peters (1991) had children witness a stranger remove a money box from a laboratory playroom in which the child was waiting. Half of the children were led to believe the stranger was a burglar, while half were led to believe the stranger had permission to take the box. All children were then asked to identify the stranger from a lineup. Children believing the stranger had permission performed better than children believing the stranger was a burglar, suggesting that stress interferes with children’s memory. However, it must be emphasized that these studies focused exclusively on face recognition of strangers, and did not assess any other aspects of children’s memories, such as the actions and objects comprising the event. In general, children, especially young children, are not very good at recognizing faces of strangers (see Davies, 1993, for an overview). Moreover, it is not clear that witnessing a burglary under these conditions is comparable to the kinds of real world traumatic events to which children are exposed.

More recently, several investigators have taken advantage of naturally occurring stressful experiences to examine children’s memories of traumatic events. Most often, this research examines painful and stressful medical procedures. Goodman and her colleagues (Goodman, Hirschman, Hepps, & Rudy, 1991; Goodman et al., 1990) pioneered this type of research, examining young children’s memories for inoculations, and for voiding cystourethromrams (VCUGs), an extremely stressful medical procedure involving catheterization, filling the bladder with fluid and voiding while still on the examination table. Overall, the results of these studies indicate highly accurate recall of these procedures. However, there are developmental and individual differences. Preschoolers, while largely accurate, are less accurate than school-aged children. Further, some children are more accurate than their same-age peers. Intriguingly, those children whose parents report talking with them about the VCUG procedure after its occurrence were more accurate than children whose parents avoided discussion of the procedure.

Research by Ornstein and his colleagues (Ornstein, 1995; Ornstein, Gordon, & Laurus, 1992) support these findings. They compared children’s reports of a well-doctor visit with
their reports of a VCUG experience, and found that children were able to provide a more exhaustive and more accurate report of the VCUG than of a well-doctor visit. Moreover, children maintained a high level of recall for the VCUG experience over several months, whereas memory for the well-doctor visit showed a sharper decline in amount of recall and a higher increase in error over time. Again, there were developmental and individual differences, with older children generally providing more detail; although preschoolers provided less information overall than older children, what they did recall was just as accurate. In addition, children who experienced the VCUG with a technician who explained the procedure to them as it was occurring recalled more information than did children who experienced the event with a technician who did not explain the procedure (Principe, 1996). Thus it seems that children’s memories of a stressful medical procedure is quite good, and especially so if adults talk with them about what occurred.

The developmental differences are not surprising, in that preschoolers generally recall less than do school age children (Nelson, 1986; Pressley & Schneider, 1986). However, it does seem that preschoolers recall more about stressful events than about non-stressful events. In addition to the Ornstein finding cited above, Bahrick, Parker, Merritt and Fivush (in press) assessed preschooler’s memories for Hurricane Andrew, a devastating storm during which children were in their homes while wind and rain caused extensive damage all around them. Three and 4-year-old children provided a surprising amount of information about their experience, averaging over 100 propositions. Because a comparable interview protocol and coding scheme was used, this can be compared to children’s memories of a family trip to Disney World (Hamond & Fivush, 1990), in which preschoolers reported approximately 40 propositions. Interestingly, children who weathered the storm under moderate stress (trees falling, windows breaking, water leaking into the house) recalled more information than children experiencing high stress (roofs caving in, flying glass, etc.). Although children experiencing high stress seemed to show less recall than children experiencing moderate stress, they still recalled substantially more than children seem to report about non-stressful experiences.

What of children younger than 3 years? We have already seen from the research on general event memory, as well as from the clinical descriptions of trauma memories, children 3 years and older are able to organize and retain personal experiences, but younger children may have more difficulty remembering and verbally reporting events. Few studies have systematically investigated stressful experiences in children under the age of 3 years. In the first study of its kind, Howe, Courage, and Peterson (1994) assessed children’s memories for emergency room experiences for injuries such as lacerations requiring sutures and severe burns. Children ranging in age from 18 months to 5 years were interviewed at home within a few days of their experience and again 6 months later. There was a general increase in ability to report information with age, and the youngest children in particular had great difficulty verbalizing their experiences. More specifically, children younger than 30 months at time of experience recalled little at either interview. Children 30 months and older were able to report their experiences at time of occurrence and could still recall them in as much detail after 6 months. Similar findings are reported by Baker–Ward and Burgwyn–Bailer (1998), who found that 3- to 7-year-old children experiencing facial lacerations were able to recall their experiences accurately and in as much detail after a 1 year delay.

Following up on this methodology, Peterson and Bell (1996) asked 2-, 3-, 4-, and 5-year-old children to recall injuries and emergency room treatments both immediately and 6 months later. From age 3 years on, children were able to report their experiences accurately and in detail, although older children recalled more than did younger children. Most impressive, there was little decline in memory over the 6 month delay. But 2-year-olds showed a different pattern. Although they were able to recall bits and pieces immediately, their reports included more error than
that memories of trauma are at least as detailed if not more so than memories of more mundane experiences. However, several factors need to be integrated with this overall conclusion.

First, although not discussed in this paper, a significant literature on suggestibility indicates that preschoolers are more suggestible than older children (Ceci & Bruck, 1993; Ceci, Toglia, & Ross, 1987). Thus, although in the absence of misleading and coercive questioning, preschoolers are able to maintain accurate memories of past experiences over long periods of time, when exposed to suggestive and especially coercive questioning, preschoolers begin to display substantially more error in their reports than do older children. The conditions under which suggestive questioning may be particularly harmful are still under debate. Children seem to be less suggestible about actions performed by themselves or on their own bodies than about actions performed by other people (Goodman et al., 1990; Rudy & Goodman, 1991; Steward, 1993). Children also seem to be less suggestible under interviewing conditions in which they are explicitly told that the interviewer may not know what happened, and that they can answer “I don’t know” when appropriate (see Goodman & Bottoms, 1993, for an overview). On the other hand, children seem to be more susceptible to suggestion when misinformation is presented repeatedly across several interviews (Leichtman & Ceci, 1995). However, simply asking a child to recall an event over and over, in the absence of misleading information does not compromise accuracy of recall (Fivush & Schwarzmueller, 1995; Poole & White, 1995), although yes/no questions lead to extremely high levels of inaccuracy, especially among very young children (Peterson & Rideout, 1997; Schwarzmueller, 1997). Clearly, when evaluating children’s memories, especially in a forensic situation, the extent and type of interviewing that has occurred must be considered in determining the credibility of the report.

Second, although 3-year-olds are quite accurate in what they report, their recall is considerably sparser than older children’s. Moreover they need more help from adults, in the
form of prompts and cues in order to recall than do older children. Here, we need to make a distinction between accuracy of recall and exhaustiveness of recall. Older children recall much more of the event, and especially more details about the event than do younger children; thus older children’s recall is more exhaustive than is younger children’s. But although more limited in amount, what young children do recall is just as accurate as older children’s recall. The fact that young children need more encouragement from adults to produce their recall also raises the question of how to best interview young children in forensic situations. Clearly, we need to strike a balance between providing prompts while at the same time not providing any misinformation. Some promising approaches to forensic interviewing of young children have been discussed in the literature (Goodman & Bottoms, 1993), but this is obviously an area in which a great deal more research is needed.

Third, there are substantial individual differences in children’s abilities to report their past experiences. Certainly some of the differences early in development are related to language ability. Because children progress through the language learning years at different rates, it follows that their ability to describe their past experiences will differ as well (e.g., Eisenberg, 1985). There are also individual differences in basic memory skills that play a role (e.g., Pressley & Schneider, 1986). In addition to specific individual differences, there are also gender and cultural differences in autobiographical reports. In general, girls seem to have more detailed and more coherent autobiographical memories than do boys (Fivush, 1998; Haden et al., 1997; Reese, Haden, & Fivush, 1996). And Caucasian children seem to have more elaborated, detailed autobiographical narratives than Asian children (Leichtman, 1997). There is also some indication that African American males incorporate more fantasy elements in their autobiographical narratives than do African American girls or Caucasian children of either gender (Sperry, 1991). Most of these differences can be attributed to differences in the ways in which children are socialized to discuss their past experiences (Fivush, in press; Mullen, 1994; Nelson, 1993), a point returned to below. Implications of these differences for forensic interviewing are clear; the social and cultural guidelines for when and how to talk about one’s personal past critically influences the ways in which children will report their past experiences, and must be considered both in interviewing young children and in evaluating the credibility of their reports.

Finally, we need to consider the issue of recalling a single versus a repeated experience. Within the literature on event memory, it is very clear that memories of repeated experiences are quite different than memories of single, distinctive events. With increasing experience with an event, children’s reports become more general and less detailed. Extrapolating to trauma memories, it would seem that repeated trauma would come to be represented in a script-like format, focusing on commonalities across experiences with a concomitant loss of detail. Provocatively, this prediction is the same as Terr’s (1991) prediction about Type II trauma discussed earlier, although the postulated mechanisms are quite different. For Terr, poor memory of repeated trauma is due to dissociation, whereas from script theory, poor memory for repeated trauma would be due to the development of a more generalized schema for the event.

Only one study has examined children’s reports of a repeated traumatic experience. Howard, Osborne, and Baker–Ward (1997) asked children who had undergone chemotherapy to recall their experiences two years after treatment ended. Children were extremely accurate in reporting their chemotherapy experiences. However, Howard et al. did not differentiate whether children were recalling a specific instance or whether they were recalling what usually occurred. As discussed
earlier, script reports are quite accurate to what typically happens, but the details of specific instances can be lost or confused. Still, this study suggests that Terr’s theory may not be completely correct, as children did not display poor memory of a repeated trauma. Clearly, this is a critical issue for future research. Because many traumatized children experience repeated instances of trauma, particularly if the trauma is physical or sexual abuse, we must gather more data on the ways in which children come to represent and report these events with increasing experience.

Perhaps most important are the qualitative changes we see in memory under the age of 3 years. Although 2-year-olds are able to verbally report bits and pieces of their past experiences, they have difficulty giving a coherent account of what occurred. More specifically, events experienced below the age of about 18 months may never become accessible for verbal report, although they may continue to influence behavior. Children may be able to retain fairly explicit nonverbal memories of a specific experience; placed back in the original context or given the specific objects, even very young children may be able to re-enact an event. But these early memories are not translated into language as the child’s language skills mature. Moreover, without language, it may not be possible to access or report experiences in the absence of physical cues about the event. That is, it is not clear how a memory could be expressed nonverbally with none of the objects from the original event available in the environment.

However, this does not necessarily mean that later memories, memories of events experienced after 18 months, are represented linguistically. Rather, events are experienced in multiple modalities and may remain accessible in multiple modalities over time. Events that cannot be verbally accessed may still be recalled in action, in images and in sensory characteristics. Language adds yet another dimension to the memory representation. But it is a critical dimension in that once children are able to use language as a modality for representing events, they also become capable of sharing their experiences with others in ways that are not possible outside of language. Children can now refer to past events in conversation with parents and caregivers, and this process of reminiscing fundamentally changes the way in which memories can be understood and represented. More specifically, through discussing events with others, both as they are occurring and in retrospect, children become able to organize events in more coherent ways. Through the narrative conventions of describing the past, children come to organize past experiences in more temporally extended and integrated ways. Moreover, narrative forms provide perspective and interpretation of events (Bruner, 1987; Fivush & Haden, 1997; Labov, 1982). Through narrating our experiences, we come to understand what these experiences mean in relation to other events in our lives, and begin to form a narratively organized life history. This narrative history, in turn, contributes to the developing sense of self in time. As children develop the skills for narrating their past, they are also developing an understanding that their past is a part of themselves.

From this perspective, the ability to discuss past experiences with others is a critical component of the developing ability to recall events to oneself. Indeed, there is growing evidence that children’s autobiographical and narrative skills develop in social interaction (Engel, 1986; Haden, et al., 1997; Hudson, 1990b; Fivush, 1991; McCabe & Peterson, 1991; Nelson, 1993; Peterson, 1990; Reese, et al., 1993). In general, children who engage in rich, embellished reminiscing with their caregivers come to discuss their past experiences in more coherent and detailed ways.

With respect to trauma memories, children experiencing stressful medical procedures under conditions in which their parents or medical caregivers discuss the events with them recall the event more accurately than children who do not discuss these events with others. Intriguingly, these children also seem to display less stress about the experience, suggesting that talking about traumatic experiences may help children to understand and cope with them. Yet one of the critical aspects of experiencing trauma is the issue of silence.
The Silencing of Trauma

Traumatized individuals often report that they are discouraged by others to discuss their experiences. For example, Shay (1996) describes the experience of Vietnam veterans, who returned with horrendous memories they felt a need to share with others and being silenced by family and friends who could not bear to hear what they had to say. Part of this may stem from a folk belief that if we simply do not talk about or think about bad experiences, they will go away. Parents, in particular, may think that if they don’t talk about traumatic experiences with their young children, then their children will simply forget what happened. Without the opportunity to discuss these experiences with others, abused children may be unable to integrate their traumatic experiences into their developing understanding of other experiences in the world and how these experiences are related to the self. This would most likely produce a fragmentary and disorganized representation of experience. Notice that this description of event representation is related to aspects of clinical descriptions of dissociation in abused children. Thus in the absence of an organized framework for understanding experience, children will display what appears to be dissociative behaviors—an inability to organize experiences, difficulty integrating experience with self-concept, and a general lack of verbal memories of personally experienced events. Clearly, I am not arguing that the consequences of abuse stem solely from the disruption of memory processing, but I would argue that this is an important part of what is happening developmentally for these children.

Conclusions

The ability to organize and understand our experiences is a basic part of how we make sense of our world. From a very early age, children are actively constructing how things happen, and forming memories of the events of their lives. From approximately age 3 years on, children’s event memories seem qualitatively similar across development. Children are able to form and retain accurate, organized, verbally accessible memories of both traumatic and nontraumatic events. Between the ages of about 2 and 3 years, children are able to give fragmentary verbal reports of
their experiences, but these reports do not seem as well organized or as accurate as older children’s. Moreover, these very early memories may be more prone to increasing error over time than later memories. Below the age of about 18–20 months, children seem unable to verbally report their experiences at all, and they do not seem to be able to construct a verbal report of these very early experiences as their language skills develop. Importantly, the developmental patterns seem quite similar for traumatic and nontraumatic experiences.

The research on traumatic memories conducted thus far, however, has focused on public events, events which may be painful or stressful, but do not involve secrecy or shame. But many traumas experienced by young children are silenced. The ability to discuss past events with others, and to verbally rehearse these events to oneself may play an instrumental role on children’s developing abilities to understand and interpret their experiences. Placing past events in the context of one’s ongoing life history allows one to integrate past experiences into a cohesive sense of how the world works and who one is. Children experiencing traumatic experiences who are not given the opportunity to discuss these events with others may not be able to integrate these negative experiences, and thus may be left with recurring fragments of memory that are associated with highly negative affect that cannot be resolved. Moreover, in the absence of adult guidance, young children may not be able to provide themselves with an appropriate framework for understanding traumatic experiences and thus remain unable to understand what has happened to them. Thus, although preschool children seem to recall traumatic and non-traumatic events quite well, a critical issue which is only beginning to be addressed in the research literature is the role of language and silence in children’s developing memories of events in general, and trauma in particular. As Binjamin Wilkomirski (1996) writes in his memoirs of his experiences as a child survivor of the Nazi concentration camps,

I grew up and became an adult in a time and in a society that didn’t want to listen, or perhaps was incapable of listening. “Children have no memories, children forget quickly, you must forget it all, it was just a bad dream.” These were the words, endlessly repeated, that were used on me from my school days to erase my past and make me keep quiet. . . . I wrote these fragments of memory to explore both myself and my earliest childhood; it may also have been an attempt to set myself free. (pp. 153–155)

As feminist theorists have pointed out, giving voice to events lends them power and credibility (Belenky, Clinchy, Goldberger, & Tarule, 1986; Gilligan, 1982). In contrast, silencing events deprives them of reality and meaningfulness. We must understand children’s developing memories of trauma both from what they tell us and from what they cannot say.

**References**


Children’s recollections

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