

Memory Development and Trauma in Preschool Children: Implications for Forensic Interviewing Professionals - A Review of the Literature

Abstract

Currently, very little research exists that connects what is known regarding autobiographical memory development with the field of child forensic interviewing. Knowledge regarding autobiographical memory development is especially important when applying forensic interviewing techniques in interviews with young children aged 3-6. Due to a lack of knowledge by interviewing professionals regarding memory development, as well as pressure from law enforcement, judges, and juries, children are often pushed beyond their capabilities. In an effort to connect these two fields of expertise, this paper explores the research regarding autobiographical memory development in preschool children, specifically focusing on the impact of trauma on children's memories as well as developmental differences regarding memory retrieval in young children. Based on a critique of the current literature, implications for future research and practice regarding the trajectory of memory development as a predictor of a child's ability to describe a traumatic event are offered.

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Introduction

Over the past fifteen years, professional and public awareness of child sexual abuse has increased dramatically. This increased awareness has fostered numerous controversies concerning the best means of obtaining information from children about their experience. Because most perpetrators deny accusations of sexual abuse and sexual assault crimes are rarely witnessed by others, child victims' accounts of their experiences are of paramount importance to investigators. The crucial importance of information obtained from children poses unique challenges for police officers, social workers and courts, all of whom are unaccustomed to relying so heavily on children for forensic evidence in court.¹ Regardless of the resolution to this controversy, most researchers agree that the manner in which children are questioned can profoundly affect the quality of children's reports.²⁻⁴ To this end, the field of forensic interviewing has responded by enhancing interviewing techniques through required training, experience, and peer review.^{5,6} However, additional expertise is needed regarding memory development in young children. Due to courts' high expectations for detailed and convincing statements from young children, autobiographical memory development, in particular, is an important consideration for the field of child abuse investigation and prosecution.

Researchers and experts in the field of autobiographical memory struggle with providing an absolute definition of autobiographical memory, making it difficult to be clear about what constitutes an autobiographical memory.⁷ In very general terms, autobiographical memory, which is a form of declarative, episodic memory, can be defined as the "memory for personally experienced events that

- i. Can be retrieved within temporal and spatial relation toward other events and

- ii. Are relevant for the self concept because they form the individual's history of life".⁸

Due to the dichotomous nature of categorical definitions, arguments occur among researchers. In light of this issue, Bauer⁷ suggests a new definition of what a prototypical autobiographical memory entails. Components of such a memory include that the memory:

- a. Holds personal relevance
- b. Is located in a particular place and time
- c. Can be expressed verbally, and
- d. Indicates auto-noetic awareness. Less prototypical memories lack one or more of these characteristics, as memories can be assessed based on the extent to which they are prototypical.⁷

In order to apply this framework to a forensic context, it is important to look at what occurs during memory development in preschool children to make their memories more and more prototypical.

Literature review

Forensic interviewing

Recently, there has been an increase in interest and research regarding the field of forensic interviewing. This is due, in part, to a significant growth in the number of Child Advocacy Centers (CACs) in the United States utilizing a multidisciplinary team approach to child abuse investigations. The number of CACs has grown from 22 membership enrolled centers in 1992 to over 650 accredited or associate centers in 2007.⁵ Contributing to this growth is the perception that by decreasing the number of investigative interviews for each child, professionals can minimize trauma and help children begin the healing process. Forensic interviewing is defined as "an

investigative process designed to help determine whether or not abuse has occurred and, if so, elicit detail in a court suitable manner”.⁶ A forensic interviewer is seen as a member of a multidisciplinary investigative team, comprised of professionals from law enforcement, social services, medical staff, and prosecution teams. The specific role of a forensic interviewer is to obtain children’s statements regarding what their experience may have been. The interviewer’s goal is to obtain these statements in an objective, developmentally sensitive, and legally defensible manner.¹ A child’s statement, whether provided to a forensic interviewer or to a jury, is one of the most important elements of a child sexual assault case. Children’s videotaped forensic interviews and testimony in court routinely influence decisions made by jurors and play a crucial role in trials.⁹ By the same token, the information obtained in forensic interviews helps investigators make informed decisions during the preliminary stages of child sexual assault investigations. Therefore, “collecting as many factual details as possible regarding alleged abuse is the primary goal of the forensic interview. Because memory development plays such a vital role in recalling events, the child’s cognitive development must first be considered when structuring the interview”.¹⁰ Young children pose particular challenges in this regard as “developmental constraints on these memory systems may influence children’s abilities to recount events in ways the legal system finds acceptable for justice”.¹¹ There is a significant need for additional research and training for forensic interviewing professionals regarding autobiographical memory development, as age appropriate retrieval cues are an important consideration. The importance of autobiographical memory to a child’s ability to describe an experienced abusive event is outlined below.

Autobiographical memory

While there is no single cause or source of developmental change in memory development, preschool children experience a minimum of three sources of age-related change in memory for specific past events in general and autobiographical memory in particular including:

- I. Changes in mnemonic processes
- II. Developments in specific conceptual domains, and
- III. Advances in narrative skills⁷

The mnemonic network is thought to reach functional capacity late in the first year and throughout the second year of life, but there is a continued development of the neural structures that support long-term declarative memory well beyond infancy.⁷ Developmental changes in specific conceptual domains such as self-concept, temporal concepts, and auto-noetic awareness are important to consider as well. The concept of self is available to children by the end of the second year of life. However, children at 18 to 24 months of age do not yet appreciate that the self extends backward and forward in time. The development of the ability to locate events and experiences in time contributes to developments in autobiographical memory as well. Autobiographical memory also involves auto-noetic awareness, a sense of conscious awareness that the child is re-experiencing an event that happened at some point in the child’s past. Auto-noetic awareness is not readily apparent in children until 4 to 6 years of age, when children demonstrate evidence of the ability to identify sources of their knowledge.⁷

In regards to developmental changes in narrative skills, children begin using past-tense forms by the middle of the second year of

life. Beginning at age 3 years, children become more significant participants in memory conversations and exhibit the ability to initiate conversations pertaining to past events. Narrative skills are especially important to autobiographical memory, as narratives are not just a convenient way to share past experiences, but also provide a script with which children can encode, store, and retrieve events.⁷ Courts “require that a child must be able to pinpoint a time and place for witnessed or experienced events”.¹¹ Therefore, autobiographical memory is important to a child’s ability to describe an experienced abusive event as it is a form of episodic memory which permits a child to think about specific past events. Arguably, children do not demonstrate episodic memory abilities until about 4 years of age, as they are not capable of thinking back to specific past events prior to that age. This is an important consideration for forensic interviewers to take into account when questioning young children.¹¹ “The emergence of autobiographical memory has been seen as marking the end of childhood amnesia”.¹² In an empirical study of 136 children aged 6-19, Peterson et al.¹² explored two important research questions regarding memory development:

1. What are the earliest memories of children and
2. Do these memories change in systematic ways as children get older?

Results showed that 6 to 9-year-olds recalled earlier events than older children, with an average age of earliest memory of 41.1 months. Girls were more likely to recall traumatic or transitional events while boys were more likely to recall play events. In addition, overall results helped to “deepen the paradox of early memory” as they indicated that while 6 to 9-year-olds have verbally accessible memories from very early childhood, they seem to disappear as they get older.¹²

Current research connecting the two areas of expertise

Trauma and memory: While there is significant scientific interest in the effects of childhood trauma on memory development, empirical research regarding the impact of trauma on autobiographical memory development in preschool children is still in the early stages of explanation. “Such knowledge is essential to explain theories about trauma and memory and to ensure proper application of memory research” to forensic settings and legal cases.¹³ In a study of 328 children aged 3 to 16 years involved in forensic investigations of abuse and neglect, Eisen et al.¹³ examined the impact of a stressful medical event on children’s memory, suggestibility, stress arousal, and trauma-related psychopathology. Results indicate that being older and scoring higher in cognitive functioning was related to fewer inaccuracies in memory retrieval. Specifically, children aged 3 to 5 provided significantly fewer correct responses to free-recall and open-ended questions as compared to older children, aged 6 to 10 and 11 to 16 respectively. By the same token, preschool children also provided significantly higher errors in memory recall when asked specific, focused questions as well as misleading questions. These findings suggest that preschool children are more prone to memory retrieval inaccuracies than older children, highlighting the importance of age appropriate forensic interviewing techniques. However, it is important to note that while preschool children made errors in retrieval, they did not necessarily provide false reports. One limitation of this study is the researchers’ failure to further investigate preschool children’s inclination to provide false reports.

In regards to the impact of trauma, Eisenet al.¹³ found that the cortisol level and trauma symptoms in children who reported more dissociative tendencies were associated with increased memory error. However, cortisol level and trauma symptoms were not associated with increased error for children who reported fewer dissociative tendencies. These findings could suggest that dissociative tendencies play an important role in moderating stress levels and trauma symptoms in children. However, dissociation may be improperly measured or operationalized in this study. In other words, it is possible that dissociation presents similar to memory error, causing it to positively correlate with increased memory error. Interestingly, children reporting sexual and/or physical abuse were found to be more accurate than those who reported neglect or who were in the non-abused control group.¹³ Additional research is implicated in this area, in order to better understand why children who experience sexual abuse and/or physical abuse might retain a better memory of the event as opposed to the experience of child neglect.

In general, research indicates that adults who report childhood trauma are more likely than adults who do not report such a history to experience memory deficits. However, a significant limitation of this type of research is that a majority of memory research in this regard utilizes retrospective accounts from adults reporting child sexual abuse experiences. Incidentally, minimal research regarding autobiographical memory specificity and trauma with adolescents indicates similar findings. De Decker et al.⁸ conducted a study of inpatient adolescents and found that higher levels of trauma, both in terms of total number and in terms of severity or related distress, were negatively associated with autobiographical memory specificity. These findings suggest that adolescents who experience self-reported trauma tend to utilize retrieval techniques involving over-generalized autobiographical memories. An obvious limitation of this study is that the sample consisted of only 27 adolescents, all of whom were receiving inpatient treatment for mental health issues. Some studies suggest that there are possible memory advantages to child maltreatment experiences as well. In a study of 175 adolescents and young adults who had been involved in the 1980's with legal experiences resulting from documented child sexual abuse, predictors of memory accuracy and errors were examined 12 to 21 years after the abuse ended.¹⁴ The participants were aged 3 to 17 at the time of their legal involvement. It is important to note that the sample did not contain individuals whose abuse ended before they were 3 years old. The researchers found that severity of posttraumatic stress disorder (PTSD) symptomatology was positively associated with memory accuracy. However, age was not significantly associated with long-term memory and frequency of abuse was associated with greater proportion of omission errors. In addition, abuse severity and greater legal involvement predicted fewer commission errors. Interestingly, maternal support following disclosure was the most significant predictor of memory accuracy.

Overall, the results of the study suggest that in addition to traditional cognitive and memory development factors, an event's traumatic impact on a child predicts accuracy of long-term memory for child sexual abuse.¹⁴ It is also important to note that in a concurrent study utilizing the same sample to examine attachment-related differences in long-term memory development, Edelstein et al.¹⁵ found that avoidant individuals who experienced severe abuse demonstrated especially poor recall of central abuse details. The findings of this study suggest that attachment style potentially moderates the relationship between severity of abuse and memory recall abilities. The impact of trauma on memory systems is important to consider in relation to autobiographical memory development and forensic interviewing.

However, developmental differences in memory retrieval are equally important to examine when considering the forensic implications of preschool children reporting abuse. Research examining memory retrieval in young children is discussed below.

Memory retrieval: Over recent years, several empirical studies have examined developmental differences regarding preschool children's ability to recall and retrieve accounts of significant events. Acknowledging that time is an integral part of the definition of autobiographical memory, Orbach et al.¹⁶ examined age-related differences in temporal attributes (i.e., sequencing, dating, number of occurrences, duration, and frequency) of allegedly experienced events in 250 forensically interviewed 4 to 10-year-old alleged victims of sexual abuse. Results indicate age-related increases in children's references to temporal attributes, both spontaneously and in relation to temporal requests. In addition, more temporal attributes were elicited from recall than from recognition memory, indicating spontaneous reporting capabilities. These findings suggest that preschool children are less capable than older children of providing temporal attributes of an event, regardless of retrieval technique. However, free recall questions are more effective than focused, recognition questions at enhancing a young child's ability to provide temporal attributes of an event.

Another important aspect of prototypical autobiographical memory involves the development of self-relevance and auto-noetic awareness. While neither variable has been specifically examined in the forensic interviewing literature with preschool children, researchers realize the importance of children demonstrating that an event was personally experienced. In this regard, one method currently utilized by researchers involves testing the consistency and accuracy of a child's statement when confronted with deception and poor interviewing techniques. This method is based on the assumption that a child's statement is representative of a true, personally experienced event if it is detailed and consistent in nature. Quaset al.¹⁷ examined the impact of repeated questions and deception on 4 to 7-year-olds' reports of body touch. Results indicate that children who were not touched and told the truth were accurate when answering repeated questions. Interestingly, children who had been touched and told the truth were the most inconsistent.¹⁷ The researchers' findings call into question the common belief that consistency is an accurate indicator of credible disclosures in children. In addition, findings suggest that children who do not experience an abusive event are less susceptible to repeated questioning versus children who experience an actual abusive event. This is an important implication for forensic interviewing professionals to consider when speaking with young children who have provided prior credible disclosures of the abusive event in question, as repeated questions may hinder the child's ability to provide an accurate account.

In a similar study comparing 3 and 5-year olds, Quaset al.¹⁸ investigated the impact of repeated interviews and interviewer bias on children's memory and suggestibility. Results indicate that in free recall, 5-year-olds were more likely than 3-year-olds to provide false reports. However, in response to direct questions, the reverse was true. These findings suggest that free recall questions may be more effective in retrieving accurate memories in young preschool children, while direct questions may be more appropriate for older preschool children. The researchers also found that children interviewed only once by the biased interviewer after a long delay made the most errors, whereas children interviewed repeatedly, regardless of interviewer bias, were more accurate and less likely to provide false reports. This

finding highlights the adverse effects of interviewer bias and delayed interviews on preschool children, as well as the potential importance of reminder cues in consolidating memory. Another important element of prototypical autobiographical memory considers the developmental changes in children's narrative skills. To examine the relationship between narrative quality and memory accuracy in preschool children, Kulkofsky et al.¹⁹ conducted a study with sixty-one 3 to 5-year-olds. Within this age range of preschool children, the researchers found no effect of age. However, results indicate that increases in narrative volume are associated with decreases in accuracy, while narrative cohesion is associated with increases in accuracy. This finding suggests that length and elaborateness of a child's statement is more indicative that the statement contains some inaccuracies, and is not necessarily indicative that the statement is true.¹⁹ In addition, narrative cohesion may be a better indicator of the type of narrative skills demonstrative of autobiographical memory, as narratives provide young children a script with which children can encode, store, and retrieve events.⁷ However, additional research in this area utilizing a larger sample size and a more specific examination of different narrative skills as they relate to autobiographical memory is warranted.

Implications

The relatively late onset of autobiographical memory compared to other types of memory indicates the need for memory development to be considered within the forensic setting, especially when preschool children are questioned about past traumatic events.⁷ Important considerations regarding this topic of study include the impact of trauma on children's autobiographical memory development, as well as the developmental differences regarding preschool children's ability to recall and retrieve accounts of significant events. Most likely, these two factors interact to influence a child's perceived autobiographical memory capabilities. However, as indicated in this paper, more research is needed in several areas. First, more research on young children is needed regarding the impact of trauma on preschool children's autobiographical memory development and retrieval abilities. A majority of the research regarding memory and trauma utilizes adult samples and focuses on the impact of trauma on long-term memory retrieval. Second, further tests of memory retrieval aids on preschool children can identify successful strategies to be potentially utilized by forensic interviewers. This is especially important for preschool children as their inability to generalize limits interviewing techniques typically used in interviews with older children and cues required to elicit traumatic memories may change over time. Third, additional research examining the non-verbal indicators of memory for traumatic experiences is warranted. Current research focuses on verbal recall as a means of measuring memory retrieval. Finally, research examining prototypical autobiographical memories as they relate to preschool children's recall of abusive events is needed. Specifically, measuring the characteristics of personal relevance, location in particular place and time, verbal expression, and auto-noetic awareness as they occur in what are viewed by the judicial system to be credible disclosures can help to bolster interviewing techniques, as well as a jury's understanding of preschool children's memory recall abilities.

Despite the need for more rigorous research regarding the intersectionality of trauma and autobiographical memory in the field of forensic interviewing, the current research suggests important practice implications for forensic interviewing professionals. First and foremost, the empirical evidence highlights the importance of a trauma-informed response for both the children who are being interviewed

as potential victims, as well as the non-offending caregivers (e.g., mothers) who accompany their child to the child advocacy center and may also receive victim support services. As shown in the literature, traumatic experiences can significantly impact memory development in young children.^{14,15} highlighting the importance of the use of forensic interviewing protocols that are considered to be "trauma-informed" and take into account the impact of trauma on the child. Furthermore, the research indicates that maternal support following a child's disclosure may be the most significant predictor of memory accuracy.¹⁴ suggesting that targeted education and support services for mothers and other primary caregivers of alleged child victims may contribute to more credible disclosures. These support services could be offered by the local child advocacy center and corresponding multidisciplinary team. In addition to strengthening a child's ability to accurately recall their traumatic memories, a trauma-informed approach for mothers and/or caregivers may also strengthen their ability to support their child throughout the often-lengthy investigation and prosecution process, as well as contribute to a more successful recovery process for the child. Therefore, specialized, trauma-informed training for forensic interviewing professionals and their support staff at local child advocacy centers could contribute to trauma-responsive interviews and services, and potentially, successful prosecutions.

Another implication for forensic interviewing professionals is the potential application of Bauer's prototypical autobiographical memory framework within the forensic interviewing context (2007). Training and interviewing protocols for forensic interviewing professionals could be enhanced to include a developmental assessment utilizing the four specific components of autobiographical memory:

- i. Personal relevance
- ii. Location in a particular place and time
- iii. Verbally expression, and
- iv. Auto-noetic awareness

More prototypical memories contain one or more of these characteristics, and a child's memories of the alleged crime could be assessed based on the extent to which they are prototypical.⁷ Use of the prototypical autobiographical memory framework could be useful to a forensic interviewing professional's ability to assess the credibility of a child's statement within the interview itself, as well as when consulting with the multidisciplinary team or describing the potential credibility of a child's disclosure statement to a jury.²⁰⁻²⁶

Conclusion

In summary, very little research exists that connects what is known regarding autobiographical memory development to the field of child forensic interviewing. This is surprising as knowledge regarding autobiographical memory development is especially important when applying forensic interviewing techniques in interviews with young children aged 3-6. Additional research can enable forensic interviewers to use different retrieval aids with different children to optimize recall of abusive events. However, additional research may hold even more important implications to policy makers in legal settings, as more reasonable expectations for children's testimony are needed.

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Conflicts of interest

None.

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