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Childhood amnesia in children and adolescents: Their earliest memories

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Investigations of childhood amnesia have almost exclusively focused on the earliest memories of adults. Here we investigate the earliest memories of children of 6–19 years old. Parents confirmed the memory events and dated the memories. There were surprisingly few developmental differences between the earliest memories of children. Although 6–9-year-olds recalled earlier events than did older children, there were no differences between older age groups. Memories from all age groups were similar in structure, social orientation, and the nature of the recalled event. However, memories of older children were more likely to involve negative affect. There were also few gender differences, although girls were more likely to recall traumatic or transitional events while boys were more likely to recall play events. Overall, results deepen the paradox of early memory: 6–9-year-olds have verbally accessible memories from very early childhood that then seem to disappear as they get older.

Childhood amnesia (often called infantile amnesia) is the absence or scarcity of autobiographical recollections among adults for events that happened in their early life, generally before their fourth birthday (Rubin, 2000; West & Bauer, 1999). In fact, most adults do not remember any events that occurred before age 3 (Kihlstrom & Harackiewicz, 1982; Pillemer & White, 1989; Wetzler & Sweeney, 1986). Typically, this is assessed by asking adults to recall their earliest memory, although some investigators ask for a number of memories from early childhood or even ask about specific early-occurring target events such as sibling births (Eacott & Crawley, 1998, 1999; Kihlstrom & Harackiewicz, 1982; MacDonald, Uesiliana, & Hayne, 2000; Mullen, 1994; Rubin, 2000; Usher & Neisser, 1993). The emergence of autobiographical memory has been seen as marking the end of childhood amnesia.

Although adults have little or no memory of their early years, young preschoolers amply demonstrate that they have a well-functioning long-term memory system that is verbally accessible. For example, it is relatively easy to engage preschoolers in memory conversations about their past experiences, and children's recollections have been shown to be remarkably accurate. Three-year-olds readily talk about events that occurred as much as a year in the past (Fivush, Haden, & Adam, 1995; Peterson, Moores, & White, 2001; Peterson & Rideout, 1998), and so do 2-year-olds, although their memory conversations may have to be more scaffolded by adults (see review in Peterson, 2002).

Thus, there is a paradox: young children readily talk about events that happened in their past, even relatively remote events, thus demonstrating that these events have entered into their verbally

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accessible long-term memory system. And yet adults seem to have no recall of any of those events that occurred before the age of approximately 3½ years, although there is individual as well as cultural variation in this age (MacDonald et al., 2000; Wang, 2001, 2003). In order to understand what happens to these memories, it is first important to fill a crucial gap in the literature: virtually no one has looked at *children's* earliest memories (Fitzgerald, 1991). Rather, the research on childhood amnesia has almost exclusively looked at the early memories of *adults*. Second, as pointed out by Wang (2003), longitudinal research that traces the maintenance and/or disappearance of early memories through childhood would enable us to directly examine the link between memory for specific events in young children and the later inability of adults to access these memories.

The present study is directed towards the first issue: what are the earliest memories of children? Furthermore, do these memories change in systematic ways as children get older? In our lab, we have found that children as young as 6 years of age are usually able to respond meaningfully to questions about early memories. In contrast, our attempts to get 4-year-olds to understand what we were asking them to do were marked by a notable lack of success. Although they readily recalled earlier events, many were from the previous month or year and were unlikely to be their earliest memories. Consequently, this investigation includes children between 6 and 19 years old. Because of the almost complete lack of prior research on children's earliest memories, this study is largely exploratory.

THEORETICAL APPROACHES

Investigators have offered several explanations for childhood amnesia and the subsequent emergence of autobiographical memory. Early explanations focused on repression (Freud, 1905/1953) or on cognitive shortcomings in young children such as a poor memory system that changes dramatically (Wetzler & Sweeney, 1986; White & Pillemer, 1979), but these explanations seem less credible in light of recent research. For example, there has been considerable recent attention focused on whether there is in fact a major shift in children's memory systems as they make the transition from toddlerhood to childhood, and reviews have concluded that there is little sign of such discontinuity (Bauer, 1997; Courage & Howe, 2002). Thus, a major shift in the memory system cannot explain the offset of childhood amnesia.

One theoretical account that has received considerable recent attention is based on social interaction, particularly early parent–child memory-sharing. It has been proposed that such parent–child reminiscing is an important factor in the development of autobiographical memory (Fivush, 1994; Hudson, 1990; Nelson, 1993; Tessler & Nelson, 1994). For instance, Nelson (1992) suggested that the emergence of autobiographical memory is facilitated by ''the exchange of representations with others through language'' (p. 176). Moreover, parent–child memory conversations provide a common cultural format for the sharing and remembering of personally experienced events. Reminiscing with parents teaches children that memory sharing is a valued activity; it also teaches children the appropriate form of memories to be shared. That is, parent–child conversations about personal experience teach children ''what to remember, how to remember, and why to remember it'' (Wang, 2003, p. 71). This theoretical approach sees the decrease of childhood amnesia as related to children's increasing narrative skills that develop through parent–child reminiscing. Thus, as narrative skill develops, infantile amnesia decreases (Fivush et al., 1995; Fivush & Schwarzmueller, 1998).

There is considerable evidence showing that narrative skills of children show substantial development throughout early childhood (Fivush et al., 1995; Peterson & McCabe, 1983). Moreover, the development of narrative skills has been repeatedly linked to parent–child conversations, and in particular the conversational style of parents during memory sharing (Fivush, Haden, & Reese, 1996; McCabe & Peterson, 1991; Peterson, Jesso, & McCabe, 1999; Peterson & McCabe, 1994; Reese, Haden, & Fivush, 1993). Parents who are elaborative and topic extending, who encourage children to elaborate on their experiences and their feelings about those experiences, have children who come to tell coherent and elaborated narratives at an earlier age. North American parents as a group tend to encourage children to elaborate on self-experience; in contrast, parents in some Asian cultures focus not on the child's individual experiences but rather on social norms, behavioural expectations, and collective experi-

ence (Wang, 2003). This in turn seems to lead children towards the development of quite different narrative styles, in which narratives are short and oriented around group interaction. In such cultures, people's earliest memories seem to be later than are those of North Americans.

A number of other explanations have also been proposed to account for childhood amnesia. For example, some investigators have proposed that the advent of a child's self-concept may play a role in spurring his or her autobiographical memory (Howe & Courage, 1993, 1997). Howe and Courage suggest that when children achieve a self-concept, indicated by the ability to visually recognise themselves, there is a self that children can attach memories to, and this permits the emergence of autobiographical memories. However, self-recognition generally emerges in the second year of life (i.e., between 18 and 24 months), much earlier than most assessments for the offset of childhood amnesia, and so others have suggested that a more elaborated and psychological self-concept must be present (e.g., Welch-Ross, 1995). In addition, the advancement of children's metacognitive faculties may play a role in this emergence of personal memory (Welch-Ross, 1995). Taking a cross-cultural perspective, Wang (2003) adds two other factors that he thinks play a role in determining when and what events from early childhood are recalled: the function of autobiographical memory within a person's cultural context, and the complexity of a person's life experience. The functional approach suggests that autobiographical memories serve social and personal functions within a society, and the life complexity approach suggests that people who live in cultures where there are frequently changing life experiences have more novel experiences, as well as ones that are able to be dated, than do people who live in societies that stress stability, continuity, and repetition of experience.

It is unlikely that any one of these theories is adequate on its own, and recent theoretical formulations have emphasised an integrated approach to the study of the emergence of autobiographical memory (Reese, 2002; Wang, 2003; Welch-Ross, 1995). In fact, recent empirical research has supported a pluralistic account of the onset of autobiographical memory. For instance, Harley and Reese (1999) found that self-recognition skills (from the self-concept theory) and maternal reminiscing style (from the social interactionist theory) both independently predicted children's future memory skills.

FACTORS INFLUENCING INFANTILE AMNESIA

The variable that has been assessed the most in research on childhood amnesia is the age of the individual at the time of their earliest memory. Although the average age has been found to be around 3½ years, this average differs considerably between individuals. Some people can recall an event that occurred when they were only 1 year old, while others cannot recall any events occurring before the age of 6 or 7, and sometimes later (Rubin, 2000). Several factors have been found to influence the age of earliest memory and as mentioned previously, culture is one of them. Others include gender and the nature of early life experiences.

Gender

Several investigators have found that females have earlier memories than do males (Davis, 1999; Mullen, 1994), and Rubin (2000) found that females had more memories for ages 2, 3, and 4 than did males. In contrast, MacDonald et al. (2000) found no differences between males and females in the age of earliest memory for New Zealand Caucasian or Maori participants, but Asian women had a later age of earliest memory than did Asian men. Mullen and Davis suggest that earlier memory in North American women is due to their greater participation in memory discussions with other family members, and in fact, Fivush (1998) suggests that parent–child memory talk may be gendered, with both mothers and fathers reminiscing about shared events more with daughters than with sons. In keeping with the social interactionist theory that emphasises the importance of parent–child memory talk, Mullen and Davis suggest that earlier memory in women reflects this interactive history. For similar reasons, the later memory in Asian women may reflect their societal devaluation and their lesser participation in family talk. Other gender differences have been found as well. Females are more likely to have memories about emotion-eliciting events, and that emotion is more likely to be negative (Davis, 1999; Friedman & Pines, 1991; Mullen, 1994; Schwartz, 1984). In contrast, males

are more likely to recall positively valenced events.

Nature of early experiences

When adults are asked to describe their earliest memories, what is the content of those memories? The nature of early life experiences has been suggested as playing a content-related role in how early people's earliest memories are. In essence, memorable experiences are often those that are unique and salient, and somehow significant to one's self (Bauer, Kroupina, Schwade, Dropik, & Wewerka, 1998; Peterson, 2002). In terms of adults' recall of early life events, Usher and Neisser (1993) found that if they had been hospitalised or had experienced the birth of a sibling, they recalled these salient life events if they had occurred when they had been as young as age 2, but adults did not recall family moves or family deaths unless they had been at least 3 years old at the time. Thus, some types of events seem to be more memorable and are more likely to be retained for years, and people who experience these events are more likely to be able to retrieve them as early memories. A number of investigators have suggested that these early-occurring remembered events are the experiences that become part of an individual's life story and contribute to their self-concept (Conway & Pleydell-Pearce, 2000; Fivush, 1994; Neisser, 1988). Wang (2003) also stresses the important contribution of the type of experience to some of the cultural differences that have been found.

Emotional tone

Because of the presumed salience of the early experiences that are remembered, an aspect of memory content that has elicited attention is the emotional tone of recalled events. Overall, a number of researchers have found that early memories are more likely than not to involve emotion (Howes, Siegel, & Brown, 1993; Kihlstrom & Harackiewicz, 1982; Mullen, 1994; Saunders & Norcross, 1988). There is some controversy over whether this emotion is more likely to be negative (e.g., Howes et al., 1993) or positive (Kihlstrom & Harackiewicz, 1982), although both emotions are well represented. Both Mullen (1994) and Saunders and Norcross (1988) found that the single most frequently recalled topic was illness or injury although, overall, the majority of the memories were associated with a pleasant or neutral emotional tone rather than an unpleasant one. Although it is often supposed that people most easily remember those personally experienced events that were traumatic in some way, Mullen found that only about one quarter of the memories involved trauma. Similarly, Kihlstrom and Harackiewicz (1982) found that most participants' earliest memories surrounded what they described as rather trivial events, but trauma was the next most frequent type of content reported by participants, followed by transitional events. However, Wang (2001, 2003) cautions that emotional elaboration in early memories is culturally relative and seems to be more typical of North Americans. In contrast, Asian adults are more likely to recall routine events that are emotionally neutral.

Social orientation

There are other content differences as well that have been discussed in the literature, such as social orientation of the memories. Some memories focus on collective activities of groups, such as the family or peer group, and the child's interactions with other members of the group are stressed. Other memories stress an individual orientation. There may be no other participants but the self mentioned, or if others are present, the theme of the memory is the person's own experiences, feelings, and role in the event. Differences in social orientation characterise memories of North American versus Asian samples of adults, with North Americans more oriented towards describing personal adventures, achievements, and feelings while Asian adults are more likely to emphasise group participation and interactions (MacDonald et al., 2000; Wang, 2001, 2003). Another way in which social orientation is measured is by counting the number or identity of all the participants mentioned, and early memories differ in the inclusion of siblings and other family members versus non-family individuals, and some even lack mention of anyone besides the self (e.g., Fakouri & Hafner, 1984; Mullen, 1994). Again, North American participants are more likely to generate early memories that mention no one but the self.

Structure

The structure of the event descriptions may also differ (Hudson, Gebelt, Haviland, & Bentigegna, 1992). Some memories conform to the structure of

a plotted story, with causal and temporal relationships between propositions. These memories have clear beginnings, middles, and ends, such as the following: ''We were at my cousin's and we drove and drove and drove, then we got stuck in the mud. And Renee's dad had to go down in the mud. Yuck. And then they putted the dog on the very back of the truck and they put some kids. And then my dad found us and got us out of the mud.'' Others seem instead to capture a moment in time, with an elaboration of multiple aspects of one event. For example, ''I can remember when I was little and when I was four we were up into PEI but we went and saw horses and they were stinky. I petted them, and they were really smelly.'' Other memories are descriptions of repeated or habitual events, such as ''I remember riding my trike up and down the driveway. I did that a lot.'' Although Wang (2003) classifies these different sorts of memories as reflecting content differences, we prefer to think of them as reflections of event structure of the memory, but they can arguably be seen as either.

Investigations that have focused on the developmental progression of children's narrative skills have often focused on the acquisition of plotted stories. Labov and Waletzky (1967/1997), in pioneering work, stated that well-structured stories have beginnings, middles, and ends; that they build up to crisis or high-point events that are then resolved. In other words, they conform to the structure of plotted stories. In an early large-scale cross-sectional study of children's narrative structure (Peterson & McCabe, 1983), it was found that this structure is increasingly found with age. Preschoolers tend to provide narratives that focus on only a couple of events, akin to the moment-in-time structure described by Hudson et al. (1992). In contrast, as children got older, their narratives were more likely to conform to the structure of a plotted story (Peterson & McCabe, 1983). However, alternative structures were persistently present, even among the oldest children studied. Narrative structure seems especially to vary in children from different cultural backgrounds (Han, Leichtman, & Wang, 1998; McCabe, 1996; Minami & McCabe, 1995), and stories from some cultures are particularly likely to focus on repeated or habitual events (Wang, 2001).

EARLIEST MEMORIES OF CHILDREN

Virtually all of the above studies of childhood amnesia focus exclusively on *adults*. While there is a robust literature on children's autobiographical memory, few investigators to our knowledge have looked at the earliest memories of *children*. Children must also have childhood amnesia for early life events, at least those that occur prior to the age of approximately 2 years. Peterson (2002) recently reviewed studies of very young children's verbal memories for events that occurred prior to their second birthday, and concluded that such memories are scarce, although occasionally present. In a 5-year follow-up of children who had been 1 or 2 years of age at the time of an injury and subsequent ER visit, Peterson and Parsons (2004) found that some of the children had no verbal memory whatsoever for these events, even after considerable prompting. Fivush and Schwarzmueller (1998) also found that some events about which children had talked when they were 3 or 4 years of age were no longer recalled when they were 8 years of age.

Anecdotally, parents claim that childhood amnesia is characteristic of their children. On a personal note, one of the authors took her son to Greece when he was 20 months old and he was very taken with the donkeys they encountered. These donkeys were the topic of considerable conversation for at least the subsequent year. Nevertheless, he had completely forgotten the donkeys as well as all his adventures in Greece by the time he was in elementary school. Surprisingly, at the age of 17 his earliest memory dates to when he was not much older than during the trip to Greece, namely 22 months—a rather pedestrian event that was not part of family discussions. He recalls being fed lots of cookies by a woman while his parents were shown by her husband around a house that they subsequently bought. He also recalls the layout of the room, the furniture, and the appearance of the woman. Extensive renovations meant that the room and furniture he recalls have little or no similarity with the current situation, and he never saw that woman again. Unfortunately, there is little in the way of systematic studies of children's memories for early events that are subsequently forgotten (Wang, 2003), although such studies would be informative.

In one of the few studies with children to report their age at the time of early memories, Davis (1999) asked elementary and high-school children to recall times during which they felt happy, sad, angry, anxious, or shy. No request was made for the memories to be early ones; rather, the participants were informed that it was the *number* of memories about each emotion that they could come up with that was important, not their age at

the time. Girls remembered more events, and rated them as being more emotionally intense, than boys did, and the age of the memories reported by girls was younger than for boys. But an important limitation of this study was that participants were not asked to try to recall their earliest memories, just various emotional experiences. In contrast, Kihlstrom and Harackiewicz (1982) specifically asked high-school students to write a brief summary of their earliest memory, and focused on the emotional content of these earliest recollections; pleasant, unpleasant, and neutral. The results showed that the ratio of unpleasant memories to total memories was about 1:3. However, they did not include participants younger than high-schoolers. Fitzgerald (1991) did focus on younger children, namely 6-year-olds and 9–10-year-olds. He showed them drawings and asked them to generate a memory related to what they saw, a memory that could be from long ago or from last week or even yesterday. Memories that children labelled as being from their first 4 years of life were numerically scarcer than predicted, which Fitzgerald interpreted as evidence for childhood amnesia. However, children were never asked for their earliest memories. In contrast, Wang (2004) specifically asked 4-, 6-, and 8-year-olds for their earliest memories, along with three recent memories. Their average age at the time of their earliest memories was 28 months. Interestingly, he found no age, gender, or culture (European vs Chinese) effects. This may be partly due to the difficulty preschoolers have with understanding the task, and partly due to the fact that he did not ask children for anything more than a year estimate (i.e., ''age 2'' versus trying to narrow the child's age to less than a 12-month spread by detailed follow-up questioning). On the other hand, there may be few developmental differences in children this young.

The present study is an investigation of the earliest memories of children between the ages of 6 and 19, from entry into primary school to the end of high school. (Although we originally included children younger than 6, we found that they had a lot of difficulty understanding the task.) Importantly, the parents of all of the children were asked about the veracity of the children's recollections and the age at which the described events took place. Age estimates by both parents and children were followed by detailed questioning to narrow down the age of the child to at most a few months, if possible. Such parental confirmation is quite rare in extant research. Because the sample of children is culturally homogeneous, the relationship between culture and earliest memories will not be explored. However, the connection between earliest memories and both age and gender will be examined. Although there is little extant research to guide hypotheses about the earliest memories of children, we hypothesise that younger children will recall events that occurred at earlier ages in their lives, as compared with older children, because younger children are closer to those events of early childhood. And if parent–child memory sharing is gendered, as proposed by Fivush (1998), it is expected that females will recall earlier events than will males.

We also predict that older children's memories will be more likely to conform to a coherent narrative structure such as a plotted story, whereas younger children's are more likely to be descriptions of moments in time. This prediction follows from our expectation that children's memory for early life events is tied to developing narrative skill, as proposed by the social interactionist model. If so, it is possible that the earliest memories of younger children will differ from those of older children in ways that reflect their less elaborated narrative skill. Although extant research has documented structural variation in children's narratives regardless of age, one of the largest contributors to that variation is culture. This factor is not relevant in the present sample, since Statistics Canada states that 97% of the people in the geographical area from which these children are drawn are of European Canadian heritage.

A number of investigators have proposed that early memories are important contributors to an individual's self-concept or view of the self (Conway & Pleydell-Pearce, 2000; Fivush, 1994; Neisser, 1988). In other words, what is remembered has significance for the self. Thus, early memories should be about events that have some kind of salience to the individual. The telescope of time may alter what is salient to the individual, and thus there may well be differences in the nature of the events that are recalled or the affect attached to those events, depending on the current age of the individual doing the remembering. However, since there is no extant research to guide hypotheses, this study is exploratory about these issues. Although we expect the majority of our North American sample to recall individual-oriented rather than group-oriented memories, in keeping with prior research with samples from this culture, we have no way of predicting whether there are systematic age-related changes in this.

METHOD

Participants

A total of 136 children participated in the study. They were divided into four age groups as follows: There were 48 children (19 girls and 29 boys) who were 6–9 years of age (mean age = 7 years 10 months, *SD* = 16.1 months, range = 6 years 1 month to 9 years 10 months); 32 children (12 girls and 20 boys) who were 10–13 years of age (mean age = 11 years 8 months, *SD* = 14.2 months, range = 10 years 1 month to 13 years 11 months); 30 children who were 14–16 years of age (mean age = 15 years 6 months, *SD* = 11.2 months, range = 14 years 3 months to 16 years 10 months); and 26 children who were 17–19 years of age (mean age = 18 years 2 months, *SD* = 8.0 months, range = 17 years 2 months to 19 years 6 months). They were almost all white, and came from a mixed socioeconomic background.

Procedure

Most of the participants were recruited as part of other studies that investigated children's memory for injuries (Peterson, Ross, & Tucker, 2002; Peterson & Whalen, 2001). As part of those studies, children were visited at home multiple times over several years. During one of these visits, investigators asked the children to recall their earliest memories: ''I want you to think way back and tell me the first thing you ever remember, something that happened when you were really little.'' Participants were also encouraged to think of a couple more of their earliest memories in case the first one they thought of was not the event that happened temporally earliest. Then children were asked to provide an estimate of how old they were at the time of the remembered event. Subsequently, one of each participant's parents (usually the mother) was asked to confirm the accuracy of the child's memory and to provide an age estimate of the target event. Rather than accepting age estimates that were given in years (e.g., ''She/I was 4 at the time''), the interviewer tried to narrow down the age to as small a range as possible by additional questioning of both the parent and child, such as, ''What season of the year was it? Summer? Winter? Was it near a holiday, like Christmas? Near a birthday? Near when you/she started preschool (kindergarten)?'' Memories that were deemed incorrect by a participant's parent (i.e., the recalled events never happened) were discarded. If parents believed a particular recollection was based solely on pictures, videos, or family stories, those recollections were not included in the analysis. However, 8% of the memories were of events that the parent had no knowledge of but were plausible according to parent report (e.g., a child swallowing a coin and being too scared to tell his parents). If they were embedded within confirmable context, they were included. The memory that was deemed to be the earliest was the one chosen for analysis. The participants' verbal recollections and the parents' confirmations were recorded on audiotapes and then subsequently transcribed. Scoring was done from these transcripts.

Scoring system

The scoring procedure was developed for the present investigation, but some of the items were adapted from the scoring procedures used in other studies (i.e., Howes et al., 1993; Kihlstrom & Harackiewicz, 1982; McCabe, Capron, & Peterson, 1001; Mullen, 1994; Weigle & Bauer, 2000). The following categories of information were scored (see Appendix for definitions and examples):

Age at earliest memory. Both the child's and the parent's estimates of the child's age at the time of the recollected memory were collected. For some children, age could be calculated with precision (e.g., first day of kindergarten). For others the age was taken as the midpoint of the range determined through detailed questioning (e.g., for ''the summer when he was 3'', the age was taken as the midpoint of that range).

Nature of the event. Events were classified as involving trauma (physical or emotional), transition (such as first day of preschool), play, or miscellaneous other.

Emotional tone. Memories were classified as involving positive emotion, negative emotion, or neutral.

Structure. The memories were classified as a plotted story, a snapshot of a moment in time, or a repeated or habitual event. If a memory was too brief to allow structural categorisation, it was excluded from structural analyses.

Social orientation. The memory as a whole was classified as having a group orientation or an individual orientation. A group orientation was a memory focused on collective activities, such as by the family or peer group. An individual orientation was a memory exclusively talking about the child's self or, if other people were mentioned, the memory focused on personal feelings or achievements, and the self's own role in events.

Two raters independently scored memories for 25% of the participants. Inter-rater agreement was 95% for nature of the event, 98% for affect, 93% for structure, and 89% for social orientation. One of the raters coded the remaining memories.

RESULTS

The focus of this investigation is an exploration of the earliest memories of children across a wide age range. The first analysis explored whether children's age at the time of their earliest memories differs depending on their current age or their gender. Subsequent analyses focused on age and gender effects on the nature of remembered events, affect attached to the events, structure of the memory report, and social orientation, these latter aspects being classified categorically. To assess whether there were Age × Gender interactions as well as age or gender effects, log linear analyses were done with follow-up chi-square analyses where appropriate.

The age of children's earliest memories was analysed in a $4 \times 2 \times 2$ ANOVA, with age (four levels) and gender (two levels) the between-subjects factors, and reporter (parent vs child) the within-subjects factor. The age of the child made a difference in how early their memories were, $F(3, 128) = 3.53$, $p = .017$. (See Table 1 for means and standard deviations.) Follow-up paired comparisons showed that the three oldest groups did not differ from each other; however, the 6–9-year-olds (M = 36 months old according to parental estimates) had significantly earlier memories than did either the 10–13-year-olds (M = 44 months, p = .042) or the 14–16-year-olds (M = 45 months, p = .009). However, differences with the 17–19-year-olds (M = 42 months) only approached significance.

Gender was not a significant factor for the age of children's earliest memory, nor was there a significant Age × Gender interaction. Thus, both girls and boys recalled similarly early events. Interestingly, the trend of the data did not support earlier memory for girls, since age of earliest memory for girls was 43 months whereas the age of earliest memory for boys was 40 months. In addition, the person estimating how old the child was at the time of the recalled events made a difference, with parents estimating their children to be over 3 months younger than children estimated (41.5 months of age vs 44.7 months of age). There were no interactions with any other factor; thus, parents consistently estimated their children to be younger at the time of the recalled events, regardless of their current age or their gender.

The types of experiences recalled by the children are shown in Table 2. Recall that events were classified as involving trauma, transitional events, play, or miscellaneous other. The largest number

TABLE 1
Age and SDs of the earliest memories recalled by girls and boys of different ages, as reported by parents and by children

	Girls			*Boys*			*Both*		
Age group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Ages as reported by parents									
6–9 years	19	37.4	14.2	29	35.2	14.5	48	36.1	14.3
10–13 years	11	46.7	20.9	21	42.1	18.8	32	43.7	19.3
14–16 years	16	48.3	22.1	14	46.4	21.0	30	47.4	21.2
17–19 years	16	43.1	18.2	10	39.7	12.9	26	41.8	16.2
All ages	62	43.3	18.8	74	39.9	17.2	136	41.5	17.9
Ages as reported by children									
6–9 years	19	41.1	16.5	29	38.1	14.4	48	39.3	15.2
10–13 years	11	50.5	14.3	21	45.0	11.9	32	46.9	12.8
14–16 years	16	54.0	20.9	14	49.9	28.0	30	52.1	24.1
17–19 years	16	42.7	16.3	10	44.3	14.3	26	43.3	15.3
All ages	62	46.5	17.8	74	43.1	17.4	136	44.7	17.6

TABLE 2
Nature of events recalled by children of different ages

		Type of event				
Age group	*Gender*	*Trauma*	*Transition*	*Play*	*Other*	*Total*
6–9 years	Girls	2 (10.5%)	6 (31.6%)	4 (21.0%)	7 (36.8%)	19
	Boys	5 (17.2%)	5 (17.2%)	11 (37.9%)	8 (27.6%)	29
	Both	7 (14.6%)	11 (22.9%)	15 (31.2%)	15 (31.2%)	48
10–13 years	Girls	4 (33.3%)	3 (25.0%)	1 (8.3%)	4 (33.3%)	12
	Boys	3 (15.0%)	3 (15.0%)	5 (25.0%)	9 (45.0%)	20
	Both	7 (21.9%)	6 (18.8%)	6 (18.8%)	13 (40.6%)	32
14–16 years	Girls	6 (37.5%)	1 (6.2%)	2 (12.5%)	7 (43.8%)	16
	Boys	2 (14.2%)	1 (7.1%)	5 (35.7%)	6 (42.9%)	14
	Both	8 (26.7%)	2 (6.7%)	7 (23.3%)	13 (43.3%)	30
17–19 years	Girls	6 (37.5%)	6 (37.5%)	2 (12.5%)	2 (12.5%)	16
	Boys	1 (10.0%)	2 (20.0%)	1 (10.0%)	6 (60.0%)	10
	Both	7 (26.9%)	8 (30.8%)	3 (11.5%)	8 (30.8%)	26
All ages	Girls	18 (28.6%)	16 (25.4%)	9 (14.3%)	20 (31.7%)	63
	Boys	11 (15.1%)	11 (15.1%)	22 (30.1%)	29 (39.7%)	73
	Both	29 (21.3%)	27 (19.8%)	31 (22.8%)	49 (36.0%)	136

of memories was classified into the miscellaneous category, involving a wide range of experiences, while memories of trauma, transitional events, and play events were approximately equally distributed at around a fifth to a quarter of the memories. A log linear analysis that included the factors of age (four levels), gender (two levels), and content (four levels) was calculated, and there was no Age × Gender interaction, by itself or in interaction with content. Nor did age interact with content. Thus, children at all ages were recalling equivalent sorts of events as their earliest memories. However, there was a significant Gender × Content interaction, Likelihood Ratio Change χ^2 (df = 3) = 8.10, $p = .045$. A follow-up 2 (gender) × 4 (event categories) χ^2 was calculated, and the nature of the events recollected by girls and boys differed, χ^2 (df = 3) = 9.03, $p < .05$. Follow-up 2 (gender) × 2 (event category) χ^2s were calculated, comparing girls' and boys' frequencies of trauma versus play events and transitional versus play events. Girls recalled relatively more trauma (29% vs 15% for girls vs boys, respectively) while boys recalled more play events (30% vs 14% for boys vs girls, respectively), χ^2 (df = 1) = 6.61, $p < .02$, and girls recalled more transitional events (25% vs 15% for girls vs boys, respectively) while boys recalled more play events, χ^2 (df = 1) = 5.38, $p < .05$.

The emotion or affect of the remembered experiences was assessed next. Table 3 shows the number of memories that were classified as involving emotion, divided into positive versus negative, and memories that were coded as neutral. Two observations are relevant: first, most memories were coded as neutral rather than emotion eliciting. Second, when an emotion was present, it was more likely to be negative. To assess the presence of Age × Gender interactions, a log linear analysis that included the factors of age (four levels), gender (two levels), and emotion (three levels) was calculated, and there was no Age × Gender interaction, by itself or in interaction with emotion. Nor was gender significant, by itself or in interaction. However, there was a significant Age × Emotion interaction, Likelihood Ratio Change χ^2 (df = 6) = 14.50, $p = .024$. To explore this interaction, we first calculated a follow-up 4 (age groups) × 2 (emotion versus no emotion) χ^2, and there were differences between ages in emotion, χ^2 (df = 3) = 8.14, $p < .05$. An additional follow-up χ^2 compared younger versus older children, and older children were more likely to have emotion-laden memories than were younger children, χ^2 (df = 1) = 4.47, $p < .05$. However, a 2 (age) × 2 (emotion) χ^2 comparing 6–9-year-olds with 10–13-year-olds was not significant, nor was another χ^2 comparing 14–16-year-olds with 17–19-year-olds. Thus, the earliest memories of children over 13 years of age are more likely to be about emotion-laden events than are those of younger children. In addition, we compared the valence of the emotion, i.e., whether it was positive or negative. Only the youngest age group (the 6–9-year-olds) provided enough

TABLE 3
Emotion coding of memories recalled by children of different ages

		Type of Emotion				
Age group		*Positive*	*Negative*	*Both emotions*	*No emotion*	*Total*
6–9 years	Girls	3 (15.8%)	4 (21.0%)	7 (36.8%)	12 (63.2%)	19
	Boys	3 (10.3%)	4 (13.8%)	7 (24.1%)	22 (75.9%)	29
	Both	6 (12.5%)	8 (16.7%)	14 (29.2%)	34 (70.8%)	48
10–13 years	Girls	0 (0.0%)	2 (16.7%)	2 (16.7%)	10 (83.3%)	12
	Boys	0 (0.0%)	2 (10.0%)	2 (10.0%)	18 (90.0%)	20
	Both	0 (0.0%)	4 (12.5%)	4 (12.5%)	28 (87.5%)	32
14–16 years	Girls	0 (0.0%)	6 (37.5%)	6 (37.5%)	10 (62.5%)	16
	Boys	1 (7.1%)	3 (21.4%)	4 (28.6%)	10 (71.4%)	14
	Both	1 (3.3%)	9 (30.0%)	10 (33.3%)	20 (66.7%)	30
17–19 years	Girls	1 (6.2%)	7 (43.8%)	8 (50.0%)	8 (50.0%)	16
	Boys	2 (20.0%)	2 (20.0%)	4 (40.0%)	6 (60.0%)	10
	Both	3 (11.5%)	9 (34.6%)	12 (46.2%)	14 (53.8%)	26
All ages	Girls	4 (6.3%)	19 (30.2%)	23 (36.5%)	40 (63.5%)	63
	Boys	6 (8.2%)	11 (15.1%)	17 (23.3%)	56 (76.7%)	73
	Both	10 (7.4%)	30 (22.1%)	40 (29.4%)	96 (70.6%)	136

positively as well as negatively valenced memories to enter into the χ^2 analysis, whereas we had to sum all three of the older age groups to get enough positively valenced memories. A 2 (age: 6–9 years vs 10–19 years) $\times$ 2 (positive vs negative emotion) χ^2 was of borderline significance, χ^2 (df = 1) = 3.66, $p < .07$. For the youngest children, a full third of their memories that explicitly involved emotion were positive, whereas for older children, only 15% of their emotion-laden memories were positive. Thus, older children were more likely to have emotion-laden memories, and the emotion was most likely to be negative.

The structure of the memories, i.e., whether they were plotted stories, descriptions of moments in time, or repeated events, was assessed next. A total of 29 out of the 136 memories (21%: 10, 5, 4, and 3 by the youngest to oldest groups, respectively) were coded as being too brief to allow adequate structural categorisation, and they are excluded. The remaining memories were entered into a log linear analysis with age (four levels), gender (two levels), and structure (three categories), and there were no significant effects. Children in the different age groups produced memories with similar structures, as well as both boys and girls. Overall, the largest proportion of the memories described moments in time, with both plotted stories and repeated events equivalently represented (see Table 4).

Data on the social orientation of the children's memories (individual versus group) are presented in Table 5. The memories overwhelmingly had an individual orientation (86%). A log linear analysis with age, gender, and social orientation had no significant effects. Thus, the social orientation of the memories did not differ depending on the age of the children nor on the children's gender. An orientation towards group activities was rare at all ages and in both girls and boys in this sample.

DISCUSSION

Overall, it is surprising how similar the first memories of children are to those of adults. Although children who were between 6 and 9 years of age had earlier first memories than did older children, there was no steady increase in age of earliest memory as children got older. Rather, all of the age groups that included children who were at least 10 years of age had a similar age of earliest memory, and that age is parallel to that found in studies of adults. Thus, the amount of time that has elapsed since the occurrence of the early events being recalled does not seem to be an important factor (except for the 6–9-year-olds). Instead, the age estimates for childhood amnesia that have been developed in research with adults seems to be applicable to children too, at least for children who are 10 years of age or older.

Another very intriguing, and somewhat unexpected, finding was that there were no age effects on the structure of participants' earliest memories.

TABLE 4
Structure of memories recalled by children of different ages

Age group	*Gender*	*Plotted story*	*Moment in time*	*Repeated event*	*Total*
6–9 years	Girls	3 (18.8%)	9 (56.2%)	4 (25.0%)	16
	Boys	7 (31.8%)	11 (50.0%)	4 (18.2%)	22
	Both	10 (26.3%)	20 (52.6%)	8 (21.0%)	38
10–13 years	Girls	5 (45.4%)	3 (27.3%)	3 (27.3%)	11
	Boys	3 (18.8%)	7 (43.8%)	6 (37.5%)	16
	Both	8 (29.6%)	10 (37.0%)	9 (33.3%)	27
14–16 years	Girls	4 (28.6%)	7 (50.0%)	3 (21.4%)	14
	Boys	3 (25.0%)	3 (25.0%)	6 (50.0%)	12
	Both	7 (26.9%)	10 (38.5%)	9 (34.6%)	26
17–19 years	Girls	5 (35.7%)	7 (50.0%)	2 (14.3%)	14
	Boys	2 (22.2%)	6 (66.7%)	1 (11.1%)	9
	Both	7 (30.4%)	13 (56.5%)	3 (13.0%)	23
All ages	Girls	17 (30.9%)	26 (47.3%)	12 (21.8%)	55
	Boys	15 (25.4%)	27 (45.8%)	17 (28.8%)	59
	Both	32 (28.1%)	53 (46.5%)	29 (25.4%)	114

Memories that were too brief to be coded for structure were excluded.

One might have anticipated that older participants, given their superior narrative skills, would have recounted significantly more plotted stories than the younger participants. Instead, children at all ages were most likely to provide a snapshot of a moment in time. Perhaps it is the level of narrative skill possessed at the age at which the memory was encoded, not the current level of narrative skill, that determines the structure of a recollection. Earliest memories may also be less likely to be detailed plotted stories because they are probably more obscure to the participants, young or old, than are later memories.

TABLE 5
Individual versus group orientation of earliest memories of children of different ages

Age group	*Gender*	*Individual*	*Group*	*Both*
6–9 years	Girls	14 (73.7%)	5 (26.3%)	19
	Boys	28 (96.6%)	1 (3.4%)	29
	Both	42 (87.5%)	6 (12.5%)	48
10–13 years	Girls	8 (72.7%)	3 (27.3%)	11
	Boys	18 (85.7%)	3 (14.3%)	21
	Both	26 (81.2%)	6 (18.8%)	32
14–16 years	Girls	15 (93.8%)	1 (6.2%)	16
	Boys	13 (92.8%)	1 (7.1%)	14
	Both	28 (93.3%)	2 (6.7%)	30
17–19 years	Girls	14 (87.5%)	2 (12.5%)	16
	Boys	7 (70.0%)	3 (30.0%)	10
	Both	21 (80.8%)	5 (19.2%)	26
All ages	Girls	51 (82.2%)	11 (17.7%)	62
	Boys	66 (89.2%)	8 (10.8%)	74
	Both	117 (86.0%)	19 (14.0%)	136

There were other similarities between the earliest memories of children, regardless of age. Overwhelmingly, they were about individual experience rather than having a group orientation. The individual orientation of the memories was expected from the cultural background of the children, namely North American Caucasian, parallel to findings of other researchers (Wang, 2003). The social orientation of the memories would undoubtedly have been different if the children had come from other cultures, specifically those that emphasise inter-connectivity within one's family and society rather than individual accomplishment and reactions. Within such a society it would be interesting to see if the orientation of children's early memories changes systematically as they get older and are socialised into their culture's expectations. However, no developmental changes were apparent in the present sample.

The nature of the experiences recalled by the children was also similar across age. In general, about a quarter or so of the children's memories involved some type of trauma, which is parallel to that found by other investigators (Kihlstrom & Harackiewicz, 1982; Mullen, 1994). But by far the majority of the children's memories did not involve trauma. There was a wide range of experiences recalled, from looking at a dandelion

growing out of a crack in the pavement, to walking across a narrow bridge over a river, to peeking at Grandma around a reclining mom's very large, pregnant belly. There were as many memories of a play episode as there were of trauma and, like other researchers, we found that the majority of the early memories were about relatively mundane experiences. Why these particular experiences are remembered for so long and others are not is still a mystery. When we told parents what their children had recalled, many of the parents not only expressed surprise at the particular early events their children had recalled, but also said that they could see no reason why those events happened to be recalled rather than others.

Emotion has often been maintained to be an integral part of earliest memories. For instance, in their investigations, Mullen (1994), Davis (1999), and Howes et al. (1993) all found emotion to be a typical component of early memories. On the contrary in the current study, with regard to participants' very first memories, there were actually more memories scored as neutral than scored as emotional. The discrepancy between previous research and the current study with respect to emotion could be due to the fact that participants in the current study were not systematically asked about emotion. In addition, the criterion for scoring a memory as emotional was strict. For instance, although a recollection of skating on a pond with Grandma might be inferred to be a positive emotional event, it was scored as neutral unless there was good reason to score it otherwise. A strict criterion was used for scoring emotion because there was often no way of telling the essential affect of a memory. For instance, it is conceivable that the child in the memory example above was frightened of Grandma or was extremely cold while skating. Thus, this study captured explicit emotional expressiveness, but may not have captured very well the emotional nature of the events. Future research should explicitly ask whether there was some kind of emotion attached to early memories.

There was a significant effect of age on whether or not the children's memories involved emotion, with older children recalling proportionately more emotion-laden events than did younger children. The two younger groups did not differ in emotionality of their memories, nor did the two older groups. Thus, it was the teenaged sample of children (14 to 19 years of age) that recalled more emotion-laden events than did younger children. Interestingly, most of these affect-related memories were negative. While the majority of the memories were neutral, when emotion was present it was more likely to be negative. This is in contrast to earlier studies with adults, which found that negative and positive memories were more balanced in number (Howes et al., 1993; Kihlstrom & Harackiewicz, 1982; Mullen, 1994; Saunders & Norcross, 1988). The more negative nature of the emotions of the children in the present study could have been because they were primed to talk about negative events. After all, they had recently suffered an injury serious enough to require hospital ER treatment, and they had just been interviewed about it. As a consequence, the memories they retrieved may have been more likely to be negative. However, this would not explain why the unbalance between negatively and positively valenced memories is so great only for older children. The youngest children were more even in their recall of negative vs positive emotional events. Nevertheless, like others, we found that it is a minority of memories that are negative.

Contrary to some previous studies which found that females had earlier first memories (e.g., Mullen, 1994), there was no significant gender difference in the age of earliest memory in the present study. However, the literature on gender differences in the age at time of earliest memory offers mixed results. For instance, MacDonald et al. (2000) found that Asian females recounted much *later* earliest memories than did Asian males. The lack of gender differences may also be related to the greater gender balance in parenting among Canadian parents and a historical trend for fathers to spend increasing time interacting with their children (Gauthier, Smeeding, & Furstenberg, 2001). Greater gender balance in parenting may well be reflected in less gender differentiation in how parents interact with boys vs girls. Therefore, it is not altogether surprising that neither gender had significantly earlier first memories in the current study.

There was, however, a tendency for girls to have more emotion-laden first memories than boys. This finding is in the same direction as previous research which suggests that females' early memories are often more emotionally charged than are those of males (e.g., Davis, 1999) and more negative than are those of males (e.g., Mullen, 1994; Schwartz, 1984). It may well be that if we had explicitly asked about the emotions attached to the children's memories, this finding may have been more robust. The tendency towards negative affect in girls' early memories is

consistent with the topic of trauma being recalled more by them, whereas boys were more likely to recall play events.

Of course, one of the most important aspects of the current study is the inclusion of an accuracy measure. Most of the reported memories included in this study were confirmed by the participants' parents. In addition, parents' age estimates were used for the great majority of the recollections analysed. However, the accuracy data must be viewed with some caution. Although most of the memories were confirmed by participants' parents, the parents were not asked to confirm every detail of the participants' recollections. Furthermore, the parents' memories are undoubtedly not perfect either, since forgetting over time is relevant for them too. In addition, some of the participants' memories occurred when the parent was not present, so there was not even an opportunity for parental confirmation. Therefore, although parental confirmation is probably a good measure of memory accuracy, it is certainly not perfect. Nevertheless, the majority of the children's earliest memories seemed to be accurate. This is in keeping with other research that has asked for parental confirmation of early memories. Eacott and Crawley (1998, 1999), for example, asked adults to recall the events surrounding the birth of a sibling that took place when they were under 3 years of age, and found that mothers confirmed most of the details recalled. However, sibling births are a highly salient event that may well be talked about over the years; in contrast, many of the early recollections of children in the present study were not the stuff of family stories and, according to parents, had never been talked about except perhaps at the time, in the same way as one talks about most events. Nevertheless, parents confirmed the children's recollections as mostly accurate.

Overall, then, an assessment of children's earliest memories fills an important gap; it also deepens the mystery of childhood amnesia. The earliest memories of children are surprisingly similar to those of adults, in spite of some of the children's quite different developmental level and their being much closer in time to the events being recalled. Although preschoolers demonstrate robust long-term verbally accessible memory about events of very early childhood, these events clearly become shrouded by time. What remain to become their earliest memories are strikingly like those of adults, including a similarity in the age of their earliest memory for children who are at least 10 years of age.

But children who are between 6 and 9 years old have earliest memories that date from a younger age. Thus, they clearly have long-term verbal recall of events that occurred a number of years earlier in their lives. What happens to these early memories of younger children? Why does the age of earliest memory increase for them as they get older, while it does not increase for older children? Future research could profitably be more fine-grained in terms of children's ages. Specifically, our youngest group included children between 6 and 9 years of age, thus spanning 4 years. It may well be that combining children of these disparate ages disguised developmental changes that were taking place but could not be picked up with such a broad age brush. Furthermore, more detailed study of early memories of children in this age range may shed light on the disappearance of these early memories.

Overall, then, this report adds to the paradox described earlier—children are able to verbally retrieve memories from a period of their lives to which they later have little or no verbal access. Thus, explanations of the typically found age for the offset of infantile amnesia that are based on cognitive shortcomings or the inability to code events in language are not tenable, since our youngest children have verbally accessible memories from as long ago as 7 years in their past, memories that they are unlikely to recall when they get older.

The social interaction hypothesis emphasises parent–child memory talk as a crucial contributor to children's learning how and what to remember (Fivush, 1994; Nelson, 1992, 1993). Narrative researchers also focus on memory talk, and they have documented substantial changes in children's narrative skills over the preschool years (Eisenberg, 1985; Fivush et al., 1995; McCabe & Peterson, 1991; Peterson & McCabe, 1983, 1994). These changes include dramatic decreases in children's dependence on adult scaffolding of what to say and how to say it during autobiographical storytelling, accompanied by increases in independent contributions to parent–child memory conversations. The largest changes are taking place during the time period identified as central to changes in childhood amnesia, and the increasing narrative skill of preschoolers may well be related to the increased access to autobiographical memories that marks the end of the childhood amnesia period. If, as social interaction theorists predict, elaborative parent–child memory talk is an important factor contributing to the

end of childhood amnesia, then it would be informative to trace the earliest memories of children who had varied in their participation in such elaborative narrative discourse as young children. One might predict that children who had elaborative and frequent parent–child conversations about past experiences would, several years later, have earliest memories that dated from a younger point in time. Such research remains to be done.

However, this study cannot be construed as providing explicit supportive evidence for the social interaction hypothesis. It is striking how many of the children's earliest memories were not the stuff of elaborated family stories or about events of which there were photo or video reminders. Sometimes these memories did not seem likely to be the stuff of any parent–child discourse at all. So even if social interaction plays a role, it must be only a general one. It does not seem likely that children are learning specifically what to remember during parent–child memory talk; rather, it may be just a tendency to verbally code and remember events which is encouraged by frequent and elaborative parent–child memory talk.

This study also does not provide explicit support for the role of a child's self-concept development (Howe & Courage, 1993, 1997). In that theoretical perspective, children must first develop a concept of self, to which self-related memories can be attached. Typical measures of this achievement suggest that a basic concept of self is attained around 18 months of age, although a more psychological sense of self develops later (Welch-Ross, 1995). But this theory cannot account for why children have long-term verbal memories for some early autobiographical experiences that then systematically disappear, as they must do if the age of earliest memory changes as children get older.

In summary, the youngest children in our sample—those between 6 and 9 years of age—had earliest memories that dated from a younger age than those of older children. Other than differences in the child's age at the time of their earliest memories, these memories from children across a wide age range are remarkably similar to the earliest memories of adults. Although younger children tended to have less affect-laden memories, in general the nature of their memories, the structure of their recall, and the social orientation of their memories were similar across childhood. Likewise, boys' and girls' earliest memories were more similar than dissimilar, except that boys tended to recall more early events that were associated with play. Future research should extend this research cross-culturally as well as to groups of children with different parent–child interactive histories within a single culture.

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APPENDIX

SCORING OF EARLIEST MEMORIES

Structure

- *Plotted Story.* There is a causal and temporal relationship between stated events, e.g., ''I was climbing a tree and I slipped and fell on the ground. Then Uncle Bruce picked me up and carried me inside.''
- *Moment-in-Time.* Description of many aspects of one isolated episode, e.g., ''I remember sitting on my back deck with four friends and I was wearing my Mickey Mouse t-shirt and we were singing 'I scream, you scream, we all scream for ice cream!' ''
- *Repeated Event.* Description of a type of event that occurred repeatedly, e.g., ''On the couch, I used to sit on my Dad's shoulders with my legs hanging down while we watched television.''

Affect

- *Positive.* This could be explicit, as evidenced by the participant's use of the following words/phrases (or their synonyms): happy, excited, laughed, giggled, proud, warm & proud, safe, ''cool'', ''had fun'', crying (tears of joy), relieved, ''high'' feeling (not drug related), ''looking forward to'', or ''hugging & kissing.'' In addition, clearly implied positive affect even without explicit positive emotion descriptors was included, such as winning a big prize.
- *Negative.* This could be explicit, as evidenced by the participant's use of the following words/phrases (or their synonyms): cry, sad, afraid, scared, frightened, terrified, lonely, mad, angry, guilty, pain, devastated, hate(d), traumatic, panicked, nerve-wracking, ''hardest thing to do'', ''almost fainted'', ''had to calm down'', embarrassed, ''almost died'', hysterical, weary, ''in a slump'', or bored. In addition, clearly implied negative affect even without explicit negative emotion descriptors was included, such as remembering breaking a leg or getting stung by a bee.
- *Neutral.* No positive or negative emotion was indicated.

Type of experience

- *Trauma.* A shock, bodily injury, illness, or a painful emotional experience, e.g., ''I was bitten by a dog.'' These traumas could be physical or emotional.
- *Transition.* A passage from one stage to another, e.g., first day of kindergarten or a third birthday.
- *Play.* These were descriptions of play sessions, or events that occurred during play.
- *Other.* These included any other miscellaneous content.

Social orientation

- *Individual orientation.* The memory exclusively concerned the self, or if other people were mentioned, the memory focused on the self's experience, role, or feelings.
- *Group orientation.* The memory was about collective activities of the family, of friends, or the school.