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When Initial Interviews Are Delayed a Year: Effect on Children's 2-Year Recall

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Three- to nine-year-old children were interviewed about a medical emergency (injury requiring hospital ER treatment) two years after it occurred. Half of the number of children had been interviewed shortly after injury as well as 6 and 12 months later, while the remaining children had had only one prior interview a year after injury. There was remarkably little long-term deterioration in memory by both groups. Having a delayed initial interview had two effects, and both were relevant only to the harder-to-remember hospital treatment event: (a) The late-interview group was less accurate, and (b) early-interview children had more extensive free recall, suggesting that multiple prior interviews teach children the "rules of the memory game" when they are asked open-ended questions. Forensic implications are discussed.

KEY WORDS: eyewitness memory; interview timing; long-term memory.

An unfortunate pragmatic reality in the forensic arena is that there are often delays between the occurrence of an event and subsequent disclosure of it. In fact, the delay between an event's occurrence and when the child is interviewed about it may often be measured in months or even years (Flin, 1993; Goodman et al., 1992). Compounding this, there are sometimes considerable additional delays between initial disclosure and later interviews. For example, a case may be put on hold for a period of time because of insufficient evidence (Ceci & Bruck, 1995). In such cases with delayed interviews, there is often serious concern about the validity of children's reports and whether information obtained under such conditions of delay is reliable.

Contributing to this concern are some studies that cast doubt on the reliability of some information provided by children after delays of 1 and 2 years. In these studies, children had been interviewed soon after an event's occurrence and again 1 and 2 years later. The accuracy of any new information provided a year or more after the target event (which had not been provided in an earlier interview) was at

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chance levels (Peterson, Moores, & White, 2001; Salmon & Pipe, 1997). However, it is important to stress that these children had had earlier opportunities to recall target events and their poor performance was only related to new information. Nevertheless, with such causes of concern, it is imperative to investigate the reliability of children's reports in situations where their initial interviews are delayed for a long period of time.

The role of delays in interview timing has both pragmatic and theoretical relevance. There are two main theoretical perspectives that make different predictions about the effect of various interview delays on long-term recall. One suggests that the optimal timing of initial interviews is very soon after event occurrence, whereas the other suggests that delayed initial interviews are most likely to be beneficial in the long run.

Some investigators suggest that interviews occurring soon after an event's occurrence are optimal and they consolidate a memory representation (Brainerd & Ornstein, 1991). They partially re-expose a person to the original event, i.e., reinstate the event in a way that strengthens the representation of the memory (Fivush & Schwarzmueller, 1995; Rovee-Collier & Shyi, 1992), buffering or inoculating against forgetting (Brainerd & Ornstein, 1991; Fivush & Hamond, 1989). In addition, subsequent recall can be aided by the structured, organized questioning of a detailed interview because it helps to arrange details of the event in a more systematic fashion (Fivush & Schwarzmueller, 1995; Peterson & Rideout, 1998; Tizzard-Drover & Peterson, 2004). A host of researchers have found that interviews held shortly after event occurrence are helpful aids to a child's long-term retention (e.g., Baker-Ward, Hess, & Flannagan, 1990; Brainerd, Reyna, Howe, & Kingma, 1990; Fivush & Hamond, 1989; Warren & Lane, 1995). Such studies suggest that when children are interviewed early, their memories are captured while still fresh, which in turn may reduce forgetting on future occasions.

Alternatively, other researchers argue that delayed initial interviews might have facilitative effects (Craik & Lockhart, 1972; Modigliani, 1976). The argument is that if the initial interview is delayed, information retrieval is more cognitively effortful and this in turn strengthens the memory trace. One of the specific concepts arising from this approach is that of the time window of forgetting (Rovee-Collier, 1995).

Working with toddlers, Hudson and Sheffield (1998) engaged 18-month olds in a range of activities and then had them re-enact these activities after delays that ranged from immediately afterwards to 8 weeks later. Subsequently, the children re-enacted the activities again 8 weeks after their prior re-enactment as well as after 6 months from the time the events originally occurred. During the first re-enactment session, children who participated after an 8-week delay recalled less than children who had much shorter delays, but both 8 weeks later as well as after 6 months, their recall was superior. Working with 4-year-olds, Roberts, Lamb, and Sternberg (1999) staged photo events, and when tested 5 weeks after the photo session, children who had had a verbal review at 4 weeks recalled more than those with no prior review or with one that occurred after one day. Importantly, they recalled more of information that both had and had not been included in the prior verbal review; thus, the prior

review of some of the information probably activated the children's memories of the events, strengthening memory traces for the whole event (Pezdek & Roe, 1995, but see Cassidy & DeLoache, 1995, who found that children's recall was maintained only for the specific items that had been included in earlier interviews). However, the delay between the 1 month review and the final memory assessment was only 1 week, and thus there would be strong recency effects. In contrast, Powell and Thomson (1997), using 4-to-8 year-olds, extended the delay to 3 months. Children participated in a series of repeated events and then were asked to recall the unique elements of the final event. Supporting the consolidating role of early interviews, at 6 weeks those children who had had an interview after 1 week recalled more than did those children who were interviewed for the first time at 6 weeks. However, there was no difference after 3 months. Thus, delaying the initial interview for 6 weeks did not lead to poorer long-term recall.

Considerably longer delays have been reported by Pipe and her colleagues (Jones & Pipe, 2002; Pipe, Sutherland, Webster, Jones, & La Rooy, 2004). Five- and six-year-olds participated in a staged activity and different groups of children were interviewed at various delays, including immediately after the event, 1 day, 1 week, 1 month, and 6 months later, as well as 1 year (Jones & Pipe, 2002) and 2 years (Pipe et al., 2004) after the target event. There was considerable forgetting for those children who were interviewed for the first time after 6 months, and even more for those interviewed for the first time 1 year later, although those who had been first interviewed at 6 months recalled more at the 1 year re-interview than did children who had been interviewed earlier. However, at the 2 year interview there was no difference between the groups. Thus, having a late initial interview (specifically after 6 months) helped at 1 year post-event, but not after 2 years. All of the children in all of the groups seemed to have equivalently forgotten the original event. An interesting phenomenon noted by both Pipe et al. (2004) and Powell and Thomson (1997) was reminiscence. Specifically, regardless of the timing of their initial interview, children recalled more in later interviews. Likewise, Fivush, Sales, Goldberg, Bahrick, and Parker (2004) found that 9–10 year olds recalled more about a devastating hurricane than they had soon after it occurred, 6 years earlier.

There is an important difference between the studies of Pipe et al. (2004) and Powell and Thomson (1997) on the one hand and Fivush et al. (2004) on the other. Although all studies document improved performance, the Pipe et al. and Powell and Thomson participants still forgot a great deal. Thus, if one applied their results to a real-world forensic situation, optimal timing for obtaining maximum information would still be as soon as possible after event occurrence, but of course this is not always possible. One limitation of these studies is the nature of the events being investigated. Perhaps the to-be-remembered events were not sufficiently salient and personally meaningful to be well remembered over the long term. Of course, this is not true for Fivush et al. (2004), but in that study there was no immediate interview for comparison and the nature of the experience was highly variable. As well, since their scoring system counted units of information, a direct comparison between the exhaustiveness of earlier vs. later accounts was impossible. Thus, it would

be informative to explore a highly memorable event that is more similar across children and for whom one can obtain measures of exhaustiveness as well as accuracy of recall. This is the purpose of the present study. The medical emergencies being recalled by the children have been shown to be highly salient and memorable events that children still recall very well even after a delay of 5 years (Peterson & Whalen, 2001). However, those children were interviewed early and often, which may well have consolidated their recall. The only exceptions are those children described in Tizzard-Drover and Peterson (2004), whose first interview was delayed a year. In that study, the preschoolers at 1 year showed poorer recall in comparison to peers who had been interviewed shortly after the target events (although there was no difference for older children). The present study is a follow-up of Tizzard-Drover and Peterson (2004) which investigates what happens to this memory after another year has gone by for those children who had not had the benefit of an early interview.

METHODS

Participants

Three age groups of children who had experienced injuries serious enough to require hospital emergency room treatment were the participants. They were White European-Canadians of mixed socioeconomic backgrounds who had been recruited from a children's hospital, the only facility that treats children within 100 miles of a metropolitan area in Canada. Because medical care is government-provided in Canada, all children, regardless of socioeconomic circumstances, are treated at this hospital. Injuries were mostly bone fractures and lacerations requiring suturing. The children had been drawn from two similar cohorts who had been recruited in different years (see Tizzard-Drover & Peterson, 2004, for detailed comparison of the cohorts). For one of the cohorts (termed the late-interview group), 53 children had been initially interviewed 1 year following their injury, and 34 were available for 2-year follow-up interviews. They included 11 children who had been 3–4 years of age at the time of injury ($M = 3.8$, range = 3.1–4.9), 12 children who had been 5–7 years old at injury ($M = 6.5$, range = 5.2–7.11), and 11 children who had been 8–9 years old at injury ($M = 9.3$, range = 8.8–9.11). The second cohort of children (termed the early-interview group, selected from Peterson, 1999) had been interviewed within a week of their injury and again at 6 months and 1-year post-injury. Children were randomly selected from this cohort to match the numbers in the late-interview group. The early-interview group included 11 children who had been 3–4 years of age at the time of injury ($M = 3.9$, range = 3.2–4.7), 12 children who had been 5–7 years old at injury ($M = 6.0$, range = 5.4–6.11), and 11 children who had been 8–9 years old at injury ($M = 8.8$, range = 8.2–9.11). The current ages of all of the children ranged between 5 and 11 years old.

Procedure

Families with injured children of the appropriate ages were recruited from the ER. Parents who were willing to participate (81%) signed consent forms allowing

us to telephone and set up home visits, which occurred within a couple of weeks. (Median delay in days was 6 and 12 days for the early and late-interview groups, respectively.) Parents (and if necessary, other adult witnesses) were interviewed about the details of their child's injury and subsequent hospital treatment, which provided a baseline for evaluating the completeness and accuracy of children's information.

Children in the early-interview group were also interviewed about the details of their injury and treatment in the initial home visit. They were re-interviewed using the same interview format 6 months later (mean delay = 6 months 0 days), and 1-year later (mean delay = 12 months 11 days). Their final interview took place 2 years following their injury (mean delay = 25 months 5 days). Children in the late-interview group had their first interview 1-year after injury (mean delay = 12 months 11 days), and their final interview 2 years after injury (mean delay = 25 months 21 days). For all follow-up interviews, when parents were contacted to set up home visits they were asked to not discuss or rehearse the incident with their children prior to the visit.

All interviews began with free recall, followed by probed recall using a standardized interview. Yes/no questions were avoided as much as possible and any yes/no responses were ignored. Interviews were audiorecorded and transcribed verbatim with all scoring done from transcripts. Interview duration averaged 30 min. Consent by both parent (written) and child (oral) was required for all interviews. Both the Human Research Ethics Committee and the (medical) Human Investigation Committee of the university approved all aspects of the study.

Scoring of Recall Data

Although each child's experience was unique, the injuries and medical treatments conformed to a general prototypical pattern (see Appendix for prototype). Some components of the prototype are relevant to all children (e.g., all were in a specific location at a particular time when they were injured—universally applicable components are marked with a "*U*" in Appendix), while some only applied to a subset of children (e.g., only some children had sutures—variable components are marked with a "*V*").

The *completeness* or exhaustiveness of the child's recall was directed towards answering the question "How much of what happened does the child accurately remember?" Determination of which prototype components applied to each child was done by perusing parental accounts, and then children's recall was scored for the presence of each. Each prototype component provided by the child was counted only once, and identified as provided during free or probed recall. Free recall was analyzed separately but probed recall was not since information volunteered during free recall was not queried again. Rather, total recall (the sum of free plus probed recall) was analyzed. Because of variation in how many prototypic components applied to each child's unique experience, children had different numbers of "scorable" items. To provide uniformity across children, the number of recalled components was converted to a percentage of those that could have been recalled,

according to parent report. Completeness was calculated by dividing the number of prototype components that had been correctly recalled by the number of prototype components that potentially could have been recalled according to the parental report. Completeness was calculated separately for injury and hospital events, and for total and free recall.

The *accuracy* of the child's recall was also assessed; this was directed toward answering the question "How much of what children actually say is accurate?" Accuracy percentages were determined by dividing the number of correct (determined by comparing their recall with the parental report) prototype components produced by a child by the sum of correct plus incorrect prototype components. Accuracy was calculated separately for injury and hospital events, and for total and free recalls. To establish reliability for both completeness and accuracy, two coders scored 15% of the transcripts, and agreement averaged 95%.

RESULTS

The analyses for total recall, which include children's free plus probed recall, will be presented first, followed by analyses of children's free recall. Both the completeness and accuracy of children's recall will be presented. All analyses include age (3 levels: 3–4 year olds, 5–7 year olds, and 8–9 year olds) and interview group (early vs. late interviews) as between-subjects variables and time (year 1 vs. year 2 interview) as a repeated measure. Analyses are conducted for separately for each event (injury and hospital treatment), and then repeated with event as a within-subjects variable. The year 1 data have been presented elsewhere (Tizzard-Drover & Peterson, 2004), and is included here for comparison purposes. Preliminary analyses showed no significant effects for gender, so data are combined over this variable.

Total Recall

Completeness

Children's recall completeness was assessed by a 3 (age) × 2 (group) × 2 (time) ANOVA, and not surprisingly, the main effect of age was significant for both injury and hospital treatment, $F(2, 62) = 5.07$, $p = .009$ and $F(2, 62) = 12.93$, $p < .001$ (see Table 1). Planned comparisons showed that 3–4 year olds were less complete than both groups of older children for both injury (Ms = 70.3% vs. 78.3% and 81.2%) and hospital (Ms = 48.4% vs. 64.4% and 65.4%) recall, which in turn did not differ from each other.

Interestingly, children's recall after 2 years was better than their recall after 1-year, $F(1, 62) = 16.72$, $p < .001$ (Ms = 80.0% vs. 73.4% for the injury event) and $F(1, 62) = 11.89$, $p = .001$ (Ms = 63.8% vs. 55.3% for hospital treatment). That is, recall became more complete with time. There were no other significant effects. When the two events were combined into one analysis, recall of the injury event ($M = 76.7\%$) was more complete than of the hospital event ($M = 59.6\%$), $F(1, 62) = 23.67$, $p < .001$.

Table 1. Total Recall: Mean Percentages (and *SD*s) of Completeness Scores at 1 and 2 Years by Group (Early or Late First Interview) and Age

Group	1-year interview		2-year interview	
	Injury	Hospital	Injury	Hospital
Early-interview group				
3–4 years	68.7% (15.4)	47.7% (12.7)	73.8% (13.0)	55.9% (16.1)
5–7 years	78.8% (9.3)	60.7% (9.9)	81.8% (12.4)	68.3% (13.2)
8–9 years	73.4% (12.5)	60.2% (13.6)	78.8% (8.8)	60.3% (13.0)
Late-interview group				
3–4 years	62.3% (16.4)	38.6% (16.5)	76.4% (18.4)	51.4% (26.8)
5–7 years	73.1% (17.0)	58.9% (12.3)	79.7% (14.8)	69.8% (17.7)
8–9 years	83.5% (6.4)	65.1% (14.5)	89.3% (13.3)	75.8% (19.9)

Note: Year 1 data comes from Tizzard-Drover and Peterson, 2004.

Accuracy

The accuracy of children's recall was also assessed by a 3 (age) × 2 (group) × 2 (time) ANOVA for each event separately as well as an additional ANOVA with event (2 levels) as a within-subjects variable. For the injury event, there were no significant effects except for an age × time interaction, $F(2, 62) = 4.35$, $p = .017$ (see Table 2). Follow-up simple-effects analyses showed that the youngest age group became more accurate with time whereas the oldest two groups became less. Furthermore, although the youngest group was less accurate than the older two groups at the 1-year interview (*M*s = 81.0% vs. 88.8% and 91.4%), all three groups were equivalently accurate at their 2-year interview (*M*s = 84.9%, 84.1%, and 85.9%, respectively).

In contrast, there were several significant effects for the hospital event. Most importantly, interview group mattered; children interviewed early were more accurate than those interviewed late, $F(1, 62) = 11.96$, $p = .001$ (*M*s = 83.6% vs. 73.0%). Age was also significant, $F(2, 62) = 7.52$, $p = .001$, and follow-up planned comparisons showed that 3–4 year olds (*M* = 69.9%) were less accurate than were either 5–7 or 8–9 year olds (*M*s = 82.0% and 83.1% respectively), which did not differ. Furthermore, children were more accurate in the earlier interview than the later, $F(1, 62) = 8.12$, $p = .006$, *M*s = 81.6% vs. 75.3%. When the ANOVA was

Table 2. Total Recall: Mean Percentages (and *SD*s) of Information Provided by Children that is Accurate at 1 and 2 Years, by Group (Early or Late First Interview) and Age

Group	1-year interview		2-year interview	
	Injury	Hospital	Injury	Hospital
Early-interview group				
3–4 years	84.3% (11.7)	78.7% (13.8)	84.6% (11.2)	78.5% (15.6)
5–7 years	92.6% (3.9)	89.7% (11.7)	86.2% (14.0)	83.7% (16.0)
8–9 years	89.8% (8.9)	88.6% (11.9)	84.8% (8.4)	82.6% (6.7)
Late-interview group				
3–4 years	77.8% (12.1)	65.2% (12.4)	85.2% (14.1)	57.0% (27.0)
5–7 years	85.0% (19.9)	81.2% (13.4)	82.0% (17.3)	73.3% (17.1)
8–9 years	93.1% (6.5)	85.2% (14.9)	86.9% (6.5)	76.2% (17.3)

Note: Year 1 data comes from Tizzard-Drover and Peterson, 2004.

Table 3. Free Recall: Mean Percentages (and *SD*s) of 1- and 2-Year Completeness Scores by Group(Early or Late First Interview) and Age

Group	1-year interview		2-year interview	
	Injury	Hospital	Injury	Hospital
Early-interview group				
3–4 years	26.5% (21.8)	17.0% (8.1)	28.8% (11.7)	17.4% (8.9)
5–7 years	39.4% (16.6)	22.3% (13.2)	43.4% (17.7)	31.6% (12.5)
8–9 years	50.2% (15.9)	33.4% (15.7)	48.5% (14.7)	33.1% (16.1)
Late-interview group				
3–4 years	18.3% (12.1)	8.9% (7.0)	28.7% (14.7)	7.2% (5.5)
5–7 years	28.8% (15.0)	16.6% (12.2)	35.7% (18.4)	12.1% (9.4)
8–9 years	51.8% (13.3)	20.1% (9.7)	44.8% (22.7)	21.9% (12.5)

Note: Year 1 data comes from Tizzard-Drover and Peterson, 2004.

recalculated with the factor of event, it was shown that children were more accurate about their injury experience ($M = 86.0\%$) than their hospital treatment ($M = 78.2\%$), $F(1, 62) = 7.42, p = .008$.

Free Recall

Completeness

The completeness of children's free recall accounts was assessed by an Age × Group × Time ANOVA for each event separately, and recalculated with the combined data using Event as an additional factor. Not surprisingly, children's free recall became more complete with age, $F(2, 62) = 14.60$, $p < .001$, and $F(2, 62) = 14.05$, $p < .001$, for the injury and hospital events, respectively (see Table 3). For both events, planned comparisons showed that 3–4 year olds were less complete than 5–7 year olds, who in turn were less complete than 8–9 year olds (Ms = 25.6% vs. 36.8% vs. 48.8% for the injury and 12.6% vs. 20.6% vs. 27.1% for hospital treatment).

There were no other significant effects for children's free recall completeness about the injury event, but interview group made a difference for children's recall about the hospital event. Those in the early-interview group gave more complete free recalls than those in the late-interview group, Ms = 32.6% vs. 24.6%, $F(1, 62) = 11.43$, $p = .001$. There were no other significant effects and no interactions.

Accuracy

Because accuracy is assessed in terms of how much of what the child actually says that is accurate, children who provided no free recall could not be included in this analysis. There were three 3–4 year olds and one 5–7 year old who provided no free recall and these children were excluded from this analysis. For ANOVAs calculated on data from the remaining children, there were no significant effects

Table 4. Free Recall: Mean Percentages of Information Provided by Children that is Accurate at 1 and 2 Years, by Group (Early or Late First Interview) and Age[a]

	1-year interview		2-year interview	
	Injury	Hospital	Injury	Hospital
Early-interview group				
3–4 years	99.2% (2.5)	97.0% (10.1)	97.2% (6.3)	97.0% (10.1)
5–7 years	99.5% (1.7)	90.3% (28.8)	99.3% (2.4)	88.0% (16.7)
8–9 years	97.8% (5.5)	98.9% (3.8)	96.4% (6.8)	93.4% (12.1)
Late-interview group				
3–4 years	97.1% (7.6)	92.9% (18.9)	98.8% (3.5)	81.2% (25.9)
5–7 years	95.0% (15.8)	95.0% (15.8)	92.1% (15.8)	82.7% (32.9)
8–9 years	97.3% (5.7)	95.0% (10.5)	96.2% (5.7)	85.6% (30.8)

Note: Year 1 data comes from Tizzard-Drover and Peterson, 2004.
[a]Three 3–4 year olds and one 5–7 year old in the late-interview group had no free recall, and these children were dropped from this analysis.

(see Table 4). Children in all three age groups and in both the early and late-interview group were equivalently accurate in both interviews and about both events in free recall.

Distribution of Errors

Although children's overall accuracy rates were high, they nevertheless made errors. To see what sort of errors children typically made, all errors were classified into the categories shown in Table 5. The most common errors were children's listing of people who were around at the time of their injury or hospital treatment, i.e., bystanders at injury or administration of first-aid, the identity of people who were in the hospital room with them during treatment or in the car on the way to the hospital. Children also erred in describing what happened after treatment, such as

Table 5. Types of Errors Made by Children

	Age group			
Type of error	3–4	5–7	8–9	Total
Actions leading up to injury	0	1	1	2(1%)
How injury occurred	2	2	2	6(3%)
Who caused it	0	0	0	0(0%)
Objects involved in injury	0	3	0	3(1%)
Location of injury	1	1	0	2(1%)
Time (of day, duration, I + H)	9	9	8	26(12%)
People around (I + H)	16	19	10	45(21%)
Gender of doctors	10	4	8	22(10%)
1st aid locations and treatment	4	9	9	22(10%)
ER waiting room	7	2	2	11(5%)
Medical treatment details	7	7	7	21(10%)
Crying	4	5	3	12(5%)
Bleeding	3	5	3	11(5%)
After treatment details	9	15	12	36(16%)
Total errors	72	82	65	219

whether they got a treat like a popsicle as well as what color it was. And they had trouble with time, both absolute time (what time of day their injury occurred, what time it was when they went to the hospital) and relative time (how long did they wait before going to the ER or in the hospital waiting room). Some children had first-aid of various sorts and in various locations applied at the time of injury, and they also made more errors when recalling these details.

DISCUSSION

The most important finding is the robust recall of highly salient events even after 2 years have gone by, and especially for those children whose first interview did not occur until a full year after the target events happened. Earlier research (Peterson, 1999) showed that for the highly salient injury event, children between 3 and 13 years of age at the time of injury had no deterioration in the completeness of their recall after 2 years, although their recall of the more confusing hospital experience was less complete with time. In that research, accuracy did deteriorate somewhat with time, although surprisingly little for the length of time involved. However, these children had had multiple opportunities to recall the target events, and thus multiple opportunities for reinstatement and rehearsal, processes which have often been shown to buffer memory against forgetting (e.g., Fivush & Schwarzmueller, 1995; Poole & White, 1995). Also importantly, these children had had their first interview within a few days of event occurrence, thus benefiting from any possible assistance that might have been provided by the extensive and organized interview that occurred when the memory was still fresh (Baker-Ward et al., 1990; Brainerd & Ornstein, 1991; Fivush & Hamond, 1989; Peterson & Rideout, 1998). But an important question left unanswered by past research was: how complete and accurate is the recall of highly salient personal events by children who do *not* have these prior rehearsal opportunities?

In the present study, the major findings are as follows: (a) In terms of total recall completeness, children did no worse in recall completeness at 2 years post-event than those children who did have several prior interviews. However, (b) interview history did affect the accuracy of their total recall, and (c) it also impacted the completeness of their free recall. Importantly, both of these effects were limited to the harder-to-recall hospital event. Each of these will be discussed in turn.

Children's total recall was equivalently complete regardless of how early or often they had been interviewed previously, and this was true for children of all ages, even those who had been 3–4 years of age at injury. This contrasts with the results reported by Tizzard-Drover and Peterson (2004), who found that an early interview *did* help the recall of the former 3–4 year olds when they were interviewed a year after the target events had occurred. In fact, these authors proposed that for preschoolers, early interviews significantly facilitate the children's organization of detail; thus, an early systematic interview helps them retain information over the long term. However, the advantages of this early and highly organized interview seem to disappear after another year has gone by. It may well be that an earlier organized and systematic interview provides benefits for later recall regard-

less of when that earlier interview occurs, even when that interview occurs a year late. Such externally-provided organization of detail (which is provided by a systematic interview) was unnecessary for older children, who did not differ at 1 year depending upon whether or not they had had an early interview. Apparently, they could engage in this detail organization on their own. But for the youngest children, this systematic interview at 1-year seems to have helped, because their recall at 2 years post-injury was not compromised relative to those children who had had early interviews.

Accuracy is a different matter than completeness, however. Interview history does seem to have an impact on accuracy of recall, but only for the hospital event. The injury event has frequently been shown to be more memorable (Peterson, 1999; Peterson & Bell, 1996; Peterson & Whalen, 2001), and probably for a range of reasons such as being more logically organized, more unique, and more likely to be spontaneously rehearsed (Peterson, 2002). Children's recall of the event with the more difficult-to-remember details seems to be helped by earlier and more frequent opportunities to rehearse.

The advantage for children who experienced early and more frequent interviews is also true when one looks at the completeness of children's free recall about hospital treatment. In effect, the more prior opportunities children have to recall the hospital event, the more complete their subsequent free recall. Essentially, prior interviews teach children what to expect in subsequent interview situations, and what sort of information the interviewer wants to hear about. Thus, free recall seems to be at least partly affected by children's social evaluation about what and how much it is appropriate to say when asked an initial open-ended question of "tell me what happened." However, free recall performance seems to be similar in accuracy between the early- and late-interview groups. As others have shown, free recall tends to be the most accurate recall that children provide (Ceci & Bruck, 1995; Peterson & Bell, 1996).

In terms of forensic implications, this study suggests that at least some types of highly salient events are well remembered by children, even if there is a considerable passage of time before an initial interview to help consolidate recall. Even children as young as 3–4 years of age at event occurrence showed excellent long-term memory for details, both in terms of completeness and accuracy. However, these events are public (since children need to visit a hospital and typically have visible indicators of injury such as casts or sutures), and relatively long-lasting in that they need time to heal. Also, these events are discussed among family and friends so that formal interviews may have little additional effect. In contrast, events that involve criminal sexual conduct are private and do not have this history of frequent discussion prior to an initial forensic interview. For such events, the timing of interviews may be more important.[3]

There is an additional issue relevant to the timing of interviews about which this study can provide no information. Forensically, allegations by a child may or may not be true; children may be reporting details that they have merely heard others talk about rather than what happened to them personally, and it may be that

[3]I am indebted to an anonymous reviewer for these points.

interview history plays a role in helping children to distinguish true from false events as well as the source of their information.[4] This study cannot address this issue.

Children did make errors, and the composition of these errors is important. After all, even if most of the details provided by a child are accurate, this is of little forensic usefulness if the important information is wrong, such as the identity of perpetrators, what the actions of those people were, and where the alleged events took place. In this study, the most common errors by children was in their listing of ancillary people, but for those children who had someone cause their injury, they never misremembered the identity of this person. Although they made occasional errors describing time, the details of first-aid administration, and what happened after their medical treatment was over, the most important details, namely what exactly happened at injury, who caused it, and where it happened, were seldom confused.

This study suggests that repeated interviewing may be more helpful than harmful, and that it is not repeated interviewing per se that is problematic, but rather poor interviewing that involves leading or suggestive questions. In the absence of such problematic interview techniques, more frequent interviews seem to help children retain the accuracy of their recall about harder-to-recall events. As well, they have an effect on free recall. Free recall has often been shown to be the most accurate recall, and children who are interviewed more frequently seem to learn the "rules of the memory game." That is, their free recalls (at least about hospital treatment) are longer and more detailed, with no compromise in accuracy.

In conclusion, children whose first interview about a highly salient and stressful personal experience was delayed for a year, and then followed up by a second interview at 2 years, showed remarkably little long-term deterioration in their memory for the target event. Their recall (when probed by questions) was just as complete as that of children who were not only interviewed soon after the event occurred but interviewed yet again two more times before their final interview at 2 years. However, children's accuracy about the more difficult-to-remember hospital event was better maintained by early and more frequent interviews. As well, children's prior interview history affected free recall completeness. Since free recall is the most accurate recall, the fact that children who had had earlier and more frequent interviews provide more extensive free recalls is forensically important.

APPENDIX: PROTOTYPE OF INJURY AND HOSPITAL TREATMENT WITH EXAMPLES OF ITEMS AND THEIR CLASSIFICATION AS UNIVERSALLY APPLICABLE TO ALL CHILDREN (*U*) OR VARIABLE (*V*)

Item	*U/V*	Example
The injury		
Time of day	*U*	*Right after lunch*
Place	*U*	In my *backyard*
Who was with you	*V*	*Mom* and my *brother* Joe
Who else was around	*V*	My *friend Anna* was playing there too

[4]See footnote 3.

APPENDIX: Continued.

Item	*U*/*V*	Example
Actions prior to injury	*U*	I was *running*
The injury	*U*	I got a big *cut* on my leg
How it occurred	*U*	I was *tripped*
Who did it	*V*	By my *brother*
What objects involved	*V*	I hit a *piece of the porch* that was sticking up
Cry	*V*	I had to just *scream*
Blood	*V*	It was *bleeding* all down my leg
Who first responded	*U*	*Mommy* heard me cry
Where you went before hospital	*V*	She took me into the *kitchen*
Actions to treat injury	*V*	She *wiped* my knee
Objects of home treatment	*V*	And put a *cloth* on my knee to soak up blood
Anyone else look/help?	*V*	My *brother* was watching
Went to hospital	*U*	Then I went to the *hospital*
Who took you to hospital	*U*	*Mom* drove me there
Who else went along	*V*	My *brother* had to come too
Time of hospital trip	*U*	We got to the hospital *half an hour later*
The hospital treatment		
Registration	*U*	A nurse *checked me in*
Vitals measured	*U*	I got my *blood pressure* taken
Waiting period	*V*	I had to *wait a long time*
Actions while waiting	*V*	I *watched the TV*
Initial exam	*U*	Finally somebody *looked at my cut*
Hospital personnel	*U*	It was a *girl doctor*
X-rays	*V*	I got *X-rays* because they thought something was still in my knee
Cast	*V*	(not relevant)
Needles	*V*	I got four *needles* to put my knee asleep
Stitches	*V*	And then I got 14 *stitches*
Bandage	*V*	I got a big *bandage* all down my leg
Procedural details	*U*	The doctor *washed out my cut* first
Other treatment objects	*V*	With *soap*
Cry	*V*	That made me *cry*
Popsicle	*V*	The nurse gave me a *yellow popsicle*
Family in treatment room	*U*	My *Mom* was in there with me

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