

STITCHES AND CASTS: EMOTIONALITY AND NARRATIVE COHERENCE

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The narratives of children (2-13 years) who had experienced trauma injuries requiring hospital Emergency Room treatment were analyzed for coherence. Specifically, the degree to which the children embedded their accounts within both an orientative and evaluative context was assessed as well as whether they organized their narratives around high points. In addition, distress of the children at both time of injury and of treatment was rated on a 6-point scale by parents. There were qualitative as well as quantitative changes in the narratives of children at different ages. As well, the children who were more distressed produced less coherent accounts. While 9-13-year-olds who were most upset produced more orientative propositions, highly distressed 2-3-year-olds produced fewer, and all age groups produced fewer evaluative propositions as distress increased. It was proposed that this pattern of decreased evaluation resembled the affect flattening found in victims of posttraumatic stress syndrome. As well, the changes in coherence across the preschool years were discussed in terms of their possible contribution to the phenomenon of infantile amnesia. (*Psychology*)

Events that are experienced very early in life do not seem to be accessible by adults. Typically, adults do not begin to recall episodes from their lives until they are 3 1/2 to 4 years of age, although an episode from their life as a 2- or 3-year-old is remembered by a few people (McCabe, Capron, & Peterson, 1991; Mullen, 1994; Pillemer & White, 1989). Recently, some researchers have argued that memories for these early experiences must become autobiographical before they are accessible in later life. In other words, they must enter into the individual's personal life story (Bruner, 1987; Fivush, Haden, & Adam, 1995; Nelson, 1992). As a prerequisite to this occurring,

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individuals must acquire a stable sense of self, and several investigators have discussed the relationship between a developing sense of self and autobiographical memory (Bruner, 1990; Fitzgerald, 1992; Fivush et al., 1995; Howe & Courage, 1993; Snow, 1990). It has also been proposed that children must additionally master language as a representational system (Nelson, 1992); through it, children begin to consciously access and socially share their memories of personal experiences (Fivush et al., 1995; Nelson, 1992; Pillemer & White, 1989). Such social sharing of memories requires that they conform to canonical structure, i.e., that they be perceived as culturally coherent by listeners. To quote Fivush et al. (1995, p. 34): "For memories to become part of the life story, they must be organized as coherent narratives. It is the canonical narrative form that gives personal memories their structure and allows them to be integrated into the developing life story."

Given the proposed theoretical role of coherent canonical structure for an individual's ability to recall events that occurred earlier in their lives, it is important to investigate the coherence of very young children's narratives. If the narratives of 2- and 3-year-olds are organized in a considerably less coherent manner than those of children 4 years and older, then this might well be a contributor to why older children and adults cannot access these early memories (Fivush et al., 1995). In support of this hypothesis, Pillemer, Picariello and Pruet (1994) found that the coherence of preschoolers' narratives predicted their ability to recall those narrativized experiences 7 years later.

One major approach for analyzing narrative coherence has suggested that narratives are organized around crisis events or emotional highpoints (Chafe, 1990; Labov, 1982; Labov & Waletzky, 1967; Peterson & McCabe, 1983). This approach sees narratives as more than a simple description of what happened, i.e., as more than a recapitulation of chronological events. In particular, it stresses the importance of orienting or setting information to situate the narrative within a larger social and descriptive context. Thus, narrators must provide information about when and where the described events occurred, who was part of the story, and such other relevant background information as will make the narrative interpretable. In addition, narrators must provide evaluative information that indicates why this event is important and interesting, or, in other words, why the narrator bothered to recount this experience. Such evaluation conveys information about why a particular experience is incorporated into the life story, and gives it coherent meaning.

Investigators have shown that by the time children are 5 years of age, their oral narratives about personal experiences generally conform to culturally appropriate canonical structure, although age-related increases in structural complexity still occur for several years (McCabe & Peterson, 1991; Peterson & McCabe, 1983). In contrast, the narratives of 2- and 3-year-olds are considerably less well-structured. In particular, children this young are often dependent upon adult prompting in order to provide information about their personal experiences, and thus the details they provide are those that have been specifically elicited by their conversational partner (Eisenberg, 1985; Fivush, 1993). Consequently, what children tell is idiosyncratic and differs from telling to telling, depending upon the questions posed by the adult. Children also do not spontaneously incorporate very much orienting or setting information into their narratives (Fivush et al., 1995; Menig-Peterson & McCabe, 1978; Peterson, 1990; Peterson & McCabe, 1994), although evaluative information is frequently present to some degree, albeit limited, in narratives by even the youngest children (Miller & Sperry, 1988). Thus, there is considerable development over the preschool years in the acquisition of canonical structure for narratives. Less coherent organization of information about personal experiences by 2- and 3-year-olds may contribute to their inability to spontaneously access memories from this period of their lives later on.

Children's developmental mastery and sophistication of culturally appropriate canonical structure as they get older will still not account for why some events from an individual's early life are later remembered while others are not. The content of those early memories plays a critical role in whether they are accessible (Mullen, 1994; Usher & Neisser, 1993), and in particular, the emotional content. Events that evoked strong emotions seem to be the ones that are most often described by adults as their earliest memories (Main, Kaplan, & Cassidy, 1985; McCabe et al., 1991; Pillemer & White, 1989). The two emotions that seem to most often accompany these early memories are joy and fear or distress (see Pillemer & White, 1989, for a review); in other words, the emotions can be either positive or negative. The remembrance of some early experiences has generated considerable interest recently because a significant number of these early memories involve trauma of some kind. In a survey by Mullen (1994), fully a quarter of the earliest memories solicited by her involved trauma or potential harm, and this proportion was even higher in those elicited by McCabe et al. (1991).

If individuals are more likely to recall experiences that are coherent and that elicited emotion, then it is possible that emotionality and narrative coherence are related in important ways. As stated by Liwag and Stein (1995, p. 9), "children have a stake in emotional events and often process them more deeply." One type of relationship between emotion and narrative structure was proposed by Hudson and her colleagues, who found that experiences eliciting different emotions are recounted in narratives that sometimes correspondingly differ in structure (Hudson, Gebelt, Haviland, & Bentigegna, 1992).

However, an important step in exploring a possible relationship between emotional content of an experience and narrative coherence is a comparison of narratives about similar events that elicited a similar emotion, but differed in terms of degree or emotional intensity. To our knowledge, this has never been done. Such a comparison would require some sort of assessment of the degree of distress experienced by the child during a real-life experience as well as an analysis of the coherence of their narratives about those experiences. This is the impetus of the present study. Ideally, the events comprising the experiences would be identical and the only differences between the experiences would be the emotional reactions of the children to those events. Such a study is impossible to conduct, partly because identical events may not elicit such divergent emotional reactions, and partly because it is impossible to elicit very high degrees of distress ethically in the laboratory, where such control over events can exist. And it is precisely those high emotion-evoking experiences that are predicted to be organized most coherently.

An approximation to such control over content was done in the present study. All children had experiences that were broadly similar: they all injured themselves sufficiently seriously that they had to be taken to the Emergency Room of a hospital. All injuries were benign enough that the children were treated as outpatients and sent home. All children had an embedding context for their injuries (when and where they occurred, who was with them, and other background information), an unexpected action-gone-wrong in which they were injured (e.g., a fall which broke a leg or gashed a forehead), tissue damage and physical pain, a rescue response by someone who gave immediate assistance, followed by transport to the hospital, registration and measurement of vital signs in the Emergency Room as well as a wait for treatment, medical treatment by a doctor, and then the trip home. Specific details differed between children (e.g., the setting of their injuries, what body

part was injured and the nature of the injury), but all conformed to a prototype of a trauma injury requiring hospital Emergency Room care.

For all these injuries and subsequent hospital treatments, parents or other adult witnesses who knew the children well (e.g., grandparents, babysitters) were asked to rate the child's degree of distress. Some children were highly distressed by their injuries ("absolutely hysterical" in the words of some parents) and other children were not. Thus, there is a wide variation in the degree of emotional distress experienced by the children. However, that variation in distress did not result in children differentially recalling the component parts of their experiences nor did it influence the number of recall errors they made when recall was probed by an extensive interview questionnaire that requested specific details (e.g., "who was the first person who came to get you after your injury?" "Was the doctor a boy or a girl?"—Peterson & Bell, 1996). However, no report to date evaluates the coherence of children's own self-structured accounts of these emotion-arousing experiences, i.e., the coherence of their free recall narratives before the interviewers began probing for lots of specific details.

In the present study, we compare the coherence of self-structured, free recall narratives produced by children who experienced different degrees of emotional distress during their medical emergencies. These children differ in the degree of distress they experienced at the time of injury as well as the degree of distress experienced at the time of hospital treatment. That is, there are two clearly distinct pain-causing episodes that are separated in time, location, and component events, and the degree of distress shown by children was assessed during both episodes.

Two possible relationships have been proposed between degree of emotional distress and children's tendency to coherently organize their narratives according to canonical narrative form. One suggests that the greater the emotion experienced during an event by children, the more coherently or canonically organized their narrative about it will be. Such an implication can be drawn from the studies suggesting that people are more likely to recall highly emotional events from their early childhoods and that children are more likely to recall events that are more coherently organized. Such a relationship between emotion and structure was also made by Peterson and McCabe (1983), who collected hundreds of narratives from children between 4 and 9 years of age. They found that narratives about personal injury (which were seen as emotional events) were commonly those that were longest and most well-

structured. On the other hand, highly emotion-arousing events may lead to less adherence to canonical narrative structure rather than more. In particular, evaluation is an important structural component of coherent narratives, but narratives about highly emotional events may be notably bereft of such evaluation (even though other structural components may be unaffected). Such a suggestion was made by Menig-Peterson and McCabe (1977-1978) when they analyzed the narratives of 3-9 year old children that specifically dealt with the highly emotional topic of death. These narratives described deaths of parents, siblings, and pets, and were singularly lacking in evaluation in comparison with these same children's narratives about other, less distressing topics. As well, a large body of clinical data on posttraumatic stress disorder shows that one of its characteristics is a flattening of affect, a dampening of emotion or emotional numbing. Individuals suffering from it minimize their emotional reactions because they are overwhelmed by them (Malt, 1994). Although posttraumatic stress disorder results from experiences that are more traumatic than the ones experienced by our subjects, it is possible that similar minimization of the evaluative component of narratives will occur. Because we have no basis for deciding between these two competing hypotheses, one suggesting greater adherence to coherent canonical narrative form as children's emotion increases and the other suggesting lesser adherence (at least in terms of the evaluation component of canonical structure), we make no a priori hypothesis about the direction of the relationship between emotion and coherence, though we hypothesize that such a relationship will exist.

The age of the children is also an important factor to be assessed. A number of investigators have suggested that there is a significant shift at age 4 in terms of both offset of infantile amnesia as well as onset of autobiographical memory (Fivush et al., 1995; Nelson, 1992; Pillemer & White, 1989), and so it is important to explore narratives of children who cross this age-4 boundary (Fivush et al., 1995). In the present study, children both younger and older are included. A pedestrian hypothesis is that as age increases, narrative coherence will increase. Of greater interest is the possibility that there is a qualitative or major shift in narrative coherence below versus above the age 4 boundary. Fivush et al. (1995) did not find a qualitative shift in coherence of narratives produced by children as they crossed this boundary, although the narratives of the older children were more complex, elaborated and coherent; however, a perusal of the narrative topics listed by these authors suggests that all are about enjoyable or happy experiences and the strength of emotional arousal is

unclear. Although we expect narratives to become longer and more coherent with age, it is unclear whether age 4 will be a major demarcation point in this development.

METHOD

Subjects

Children were recruited from the Emergency Room (ER) of a children's hospital in Newfoundland, Canada. They were White and from mixed SES backgrounds. All of them experienced a trauma injury (as defined by ER personnel), including lacerations requiring suturing (62 subjects), bone fractures (22 subjects), dog bites (2 subjects), head impact requiring X-ray (1 subject), and crushed fingers requiring drainage (1 subject). Children visiting the ER because of illness or more minor injuries such as sprains or abrasions were excluded, as were children for whom the ER staff suspected abuse. All children were sent home after outpatient treatment. The study included a total of 90 children, 30 children (15 girls and 15 boys) in each of three age groups, two preschool-aged and an older group for comparison: (a) 2–3-year-olds (mean age 2; 10, range 2; 2–3; 11), (b) 4–5-year-olds (mean age 5; 1, range 4; 0–5; 11), and (c) 9–13-year-olds (mean age 11; 2, range 9; 0–13; 10).

Procedure

Parents and children were approached in the ER and the study was explained. Informed consent forms were signed and permission obtained for telephoning to set up home interviews. Most families (85%) visiting the ER agreed to participate. The parents were phoned within a few days and both children and parents were interviewed in their home (mean delay between injury and interview = 6.6 days, range 2–14 days). For 26 children, a parent did not witness their child's injury so other relevant adult witnesses were interviewed, including grandparents, babysitters and teachers. These were equally distributed across all ages. A parent always witnessed their child's hospital treatment.

When the interviewer telephoned to set up a home interview, she asked that parents not rehearse the events with their children prior to her visit, since she was interested in their memories. When visiting the home, the researcher

first developed rapport with the children and then interviewed them using a standardized format. The first question asked of the children was a free-recall probe: "Tell me about when you hurt yourself. What happened?" Some children (30%) told about both their injury and subsequent hospital treatment after this probe. The remainder of the children only talked about their injury; for these children, a second free-recall probe was given: "Tell me about when you went to the hospital." Unfortunately, four girls in the youngest age group were not given the free recall probe about the hospital. Thus, for the 2-3 year old girls, there are 15 who provide narratives about their injury and only 11 who provide narratives about the hospital treatment. All children were then extensively probed for specific details using a standardized interview procedure.

The children's self-constructed narratives are the only ones that can appropriately be analyzed for coherence. Thus, the only data that are analyzed in this report are the narratives elicited by the initial free recall prompts, before the interviewer began probing for specific sorts of information. After the interviewer began her questions, the children's responses were highly constrained by the particular questions that were asked and thus the subsequent interaction conformed to a question-answer sequence rather than a narrative format. Other reports present an analysis of the amount and accuracy of children's recall during the entirety of their interviews (Peterson, 1996; Peterson & Bell, 1996).

After child interviews were complete, the adult witnesses were interviewed. For the present purposes, only their ratings of the children's emotional responses are analyzed. Parents (or other witnesses) were asked to rate the degree of distress exhibited by their children both at the time of injury and at hospital treatment. The stress ratings of parents have been shown to be reliably comparable to those of trained observers (Goodman et al., 1991) and most parents observed both injury and hospital treatment. The stress ratings at the two different episodes of injury and hospital treatment were not correlated with each other, either for the same witness who observed both episodes or for different witnesses ($r_s = 0.006$ and 0.27 , $p_s = 0.96$ and 0.17 respectively). Thus, children who were quite upset at the time of injury were not necessarily also highly distressed at the time of medical treatment. Stress ratings were not asked of the children themselves since most were quite young and could not have provided meaningful data. The stress scale ranged from 1 ("not stressed at all, not upset") to 6 ("extremely upset, highly

stressed"). Although the scale does not include positive affect, none of the children were described as "happy" by their parents during either episode.

Cohereance Coding

The interviews were transcribed verbatim and the children's responses to the free recall probes were identified as the data to be analyzed. For 70% of the children, their narratives about their injuries and about their medical treatment at the hospital were elicited by separate prompts. For the remaining children who told about both injury and hospital experiences within one narrative following the first prompt, their narratives were artificially divided into two segments: the part describing their injury and the part describing their hospital visit. This was done for two reasons: (a) the data from these children would be comparable to that from the other children in that the two episodes were scored separately, and (b) the data could be compared to the child's distress score during that same episode.

Each of the two narratives was divided into propositions. These were defined as subject-verb constructions, parallel to the coding of Fivush et al. (1995). Each proposition was then classified into the mutually exclusive categories of Orientation, Action, or Evaluation. Each of these types of propositions were then broken down into mutually-exclusive subtypes, as described below. Twenty percent of the narratives were coded by a second person, and the reliability of classification varied between 87% and 98% for the different categories.

I. Orientations. These were defined in similar ways to Fivush et al. (1995) which were based on Peterson and McCabe (1983). They were propositions that provided information about the spatial and temporal context as well as relevant background for the events being described. There were four subcategories of orientations. These included propositions about the following: (1) *Time* of the events (either historical or narrative): "It was lunchtime." "Me and my mommy stay in the hospital for a half hour." (2) *Character introduction*: "My friend's dad was there." (3) *Background information* which placed the events in context: "I was up in the air doing handstands." "There was one rock here." (4) *Place* or location that the events occurred: "I was out to Matthew's place." "We went down to X-ray."

II. Actions. These were defined the same way as in Hudson et al. (1992), who differentiate actions in terms of the role of the action to the storyline,

similar to Labov's proposals (1982; Labov & Waletzky, 1967). The following subtypes of actions were differentiated: (1) *Rising action* is any action that adds dramatic tension to the narrative. It usually leads up to the climactic event: "I lost my balance." "I fell." (2) *Climax action* is the climactic moment of the narrative, which was seen as the actual injury (e.g., the laceration or bone fracture) or the actual application of treatment (e.g., the stitches): "I split it open." "I got four stitches." (3) *Falling action* follows the climax and resolves it or suggests that the dramatic tension is dissipating: "And then I went home."

III. Evaluations. These were propositions that provided affective or evaluative commentary on the event, and were derived from Fivush et al. (1995) and Peterson and McCabe (1983). There were four subtypes of evaluations: (1) *Intensifiers* added intensity or emphasis, and included use of attention-getters: "(One of the doctors came in, I can't remember her name,) but she came." "(It wasn't my bike,) and it wasn't even mine." "Know how sweaty I was?" (2) *Qualifiers* are devices that convey the narrator's attitude: "It really hurt." "But it got all better." (3) *Internal responses* are clauses that describe either the cognitions or the affect of the participants, i.e., their mental states: "I thought it was sprained." "I was screeching." (4) *Dialogue* are clauses that reference quoted speech: "She asked me if I could lift my arm."

RESULTS

Narrative Coherence

The coherence of the children's narratives will be discussed first. Table 1 presents the average length (and standard deviations) of the narratives produced by the children about their injuries and hospital experiences. In addition, the number of propositions within the three categories of orientation, action and evaluation are presented for each episode of their experience (injury vs. hospital). These categories are collapsed over the relevant subtypes of each type of proposition. Two things are apparent from the table: the 2-3-year-olds are telling very short narratives, and these narratives are mostly about the actions that took place. That is, there is little embedding of their accounts within either an orientative or evaluative context. In fact, 21 of the 30 narratives about their injuries had no orientative embedding whatsoever and 16 of 26 hospital narratives likewise lacked any such orientation. In

TABLE 1
 Mean Lengths (and Standard Deviations) of Children's Narratives about Injury and Hospital Treatment as well as Number of Propositions about Orientation, Action and Evaluation by Age

Proposition type	Age group		
	2-3 years	4-5 years	9-13 years
INJURY			
Orientations	0.50 (0.82)	0.87 (1.20)	2.57 (2.57)
Actions	2.80 (1.63)	4.93 (1.98)	9.60 (4.75)
Evaluations	0.87 (0.97)	2.07 (2.29)	3.07 (2.85)
Total length	4.17 (2.06)	7.87 (4.52)	15.24 (8.00)
HOSPITAL			
Orientations	0.58 (0.99)	1.07 (1.17)	3.17 (3.74)
Actions	1.50 (2.12)	3.57 (2.97)	5.40 (5.21)
Evaluations	0.69 (1.01)	2.63 (3.62)	3.47 (4.64)
Total length	2.77 (2.70)	7.27 (6.20)	12.04 (11.63)

terms of an evaluative context, 16 of the youngest children's 30 narratives about injury and 14 of their 26 narratives about hospital treatment lacked any such information. By the age of 4-5 years, children's narratives include more evaluative context, but many narratives still lack any orientative embedding. Of the 30 narratives produced by 4-5-year-olds about each episode, 17 of the injury narratives and 12 of the hospital narratives lacked any orientation propositions, while 9 and 10 narratives about each episode lacked evaluation. Thus, many children produced bare-bones accounts that consisted entirely of action propositions. Of course, evaluative or orientative information could have been embedded within an action clause (such as by adding an evaluative word in an action clause), but the children seldom produced clauses whose major function was orientation or evaluation.

In all the following analyses, the children's two narratives about their injuries and hospital treatments were analyzed separately, and analyses of variance were calculated with age the between-subject factor. Significant effects were followed by planned comparisons. Preliminary analyses included gender as a separate factor but it was never significant, either alone or in interaction with other factors, so gender groups are combined in all analyses.

In terms of the overall length of the children's narratives, both their injury and hospital narratives became longer with age, $F(2, 87) = 32.13$, $p < 0.001$

and $F(2, 84) = 8.64$, $p < 0.001$ respectively. Planned comparisons showed that all age groups differed. The type of proposition (orientations, actions and evaluations) was treated as a within-subject variable in the next set of analyses, with age the between-subject variable. For both injury and hospital narratives, the type of proposition differed in frequency, $F(2, 174) = 140.10$, $p < 0.001$ and $F(2, 166) = 17.86$, $p < 0.001$ respectively. The number of action propositions was greater than evaluations which in turn was greater than orientations.

Both analyses showed significant age main effects, $F(2, 87) = 31.92$, $p < 0.001$ and $F(2, 83) = 8.62$, $p < 0.001$, respectively. There was also a significant age X proposition interaction for the injury narratives, $F(4, 174) = 59.17$, $p < 0.001$, but there was no significant age X proposition interaction for the hospital narratives. Follow-up univariate F-tests found significant age effects for all three types of proposition in the injury narratives, with the two youngest groups providing equivalent and fewer orientations than did the oldest group; the youngest group provided fewer evaluations than did the two older groups which did not differ from each other, and all age groups differed in terms of the number of action propositions they provided.

In summary, neither group of preschoolers provided very much orientative context to their narratives, whereas the 9–13-year-olds provided a considerable amount. On the other hand, evaluative context became a prominent part of the children's narratives at a younger age; the 4–5-year-olds provided as many evaluative propositions as did the 9–13-year-olds. Only the 2–3-year-olds produced narratives that were relatively impoverished in propositions of both types of context.

The subtypes of each category of proposition were also analyzed by means of analyses of variance, with age the between-subject variable and proposition subtype the within-subject variable. These analyses were done separately for the injury and the hospital episodes. First, we present data on the relative frequencies of each subtype of orientation produced by the children. Recall that these subtypes include information about time, characters, background, and place. These frequencies of orientation subtypes about both injury and hospital episodes are shown in Figure 1. The subtypes of orientation differed, both for the injury and hospital episodes, $F(3, 261) = 12.20$, $p < 0.001$ and $F(3, 249) = 8.34$, $p < 0.001$ respectively. However, the pattern of orientation frequencies differed for the two episodes. The most common injury orientations were about background information whereas the most common

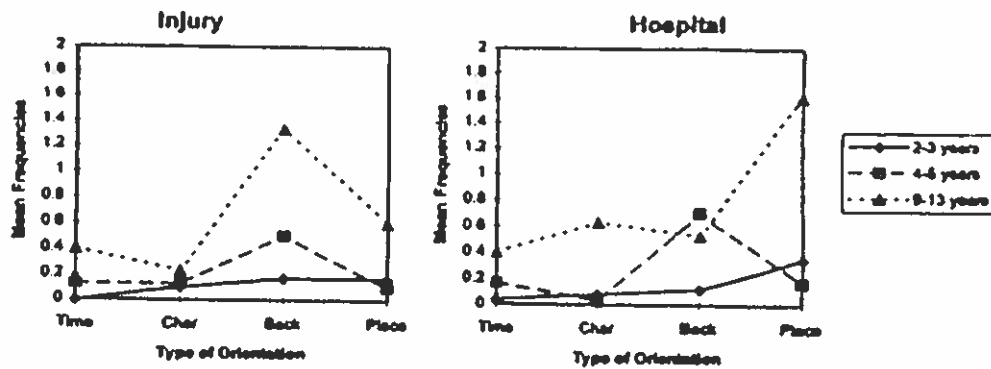


Figure 1

Mean frequencies of children's production of different types of orientation (time, characters, background, and place).

hospital orientations were about place. This makes sense; it is the injury, not the medical treatment, that requires situating within a background context. The hospital narratives included more place information because the children not only talked about going to the hospital, they also talked about various locations within the hospital such as the X-ray room and waiting room.

Predictably, there was a significant age main effect, $F(2, 87) = 13.26$, $p < 0.001$ and $F(2, 83) = 3.68$, $p < 0.001$ for the injury and hospital narratives, respectively. This was modified by an age \times orientation subtype interaction, $F(6, 261) = 3.94$, $p = 0.001$ and $F(6, 249) = 6.88$, $p < 0.001$ for the injury and hospital narratives, respectively. For the injury narratives, follow-up univariate F-tests showed that the frequencies of all orientative subtypes except character increased with age. Planned comparisons showed that this increase with age only occurred for the oldest age group for orientations about time, background and place, while the two younger age groups did not differ for these subtypes of orientation. For the hospital episode, follow-up univariate F-tests showed that the frequencies of time, characters and place orientations increased with age, and for both characters and place, this increase was only significant for the oldest age group, with the younger two groups not differing. For time propositions, the oldest age group only differed from the youngest.

Thus, children include more propositions about orientative context as they get older. However, this increase is mostly after the preschool years. It is the

9-13-year-olds who particularly focus on this sort of contextual embedding. These older children also provide differentiated sorts of orientative detail, depending upon what they are talking about. They emphasize background information when talking about their injuries and location when talking about their hospital experience. Thus, their narratives are becoming contextually richer in terms of orientation.

The mean frequencies of each subtype of action proposition for both the injury and hospital episodes are shown in Figure 2. These subtypes include rising action, climax action, and falling action. The subtypes of action differed from each other, both for the injury and hospital episodes, $F(2, 174) = 66.18$, $p < 0.001$ and $F(2, 166) = 4.13$, $p = 0.018$ respectively. For the injury episode, planned comparisons showed that rising actions were most frequent, followed by falling actions; climax actions were infrequent. For the hospital episode, planned comparisons showed that rising and falling actions were equivalently frequent, followed by climax actions. Age was a highly significant main effect in both analyses, $F(2, 87) = 36.59$, $p < 0.001$ and $F(2, 83) = 7.61$, $p = 0.001$ respectively, and there was a significant age X action subtype interaction as well, $F(4, 174) = 9.46$, $p < 0.001$ and $F(4, 166) = 4.27$, $p = 0.003$. Follow-up univariate F-tests showed that both rising and falling actions increased with age during narratives about both episodes, although climax actions did not. For injury and hospital rising action, the youngest two groups did not differ from each other; for injury falling actions, each age group differed from the others; and for hospital falling actions, the oldest two groups did not differ from each other.

Overall, children are describing the rising actions that led up to the crisis event of the actual injury or medical procedure. These crisis actions seem to require no more than a single proposition at most to specify them. The children then delineate falling actions about what happened after these crisis events. Note that the children are much more extensive in their description of rising and falling actions during the injury episode than the hospital episode. In fact, they provide approximately twice as many actions in each of these two categories when narrating about their injuries as opposed to their hospital treatment. Thus, the injury is the episode that seems to require extensive action detail, and this is increasingly true as the children get older.

We turn now to the mean frequencies of evaluation subtypes, namely intensifiers, qualifiers, internal responses, and dialogue. These frequencies are found in Figure 3. The subtypes of evaluation differed from each other,

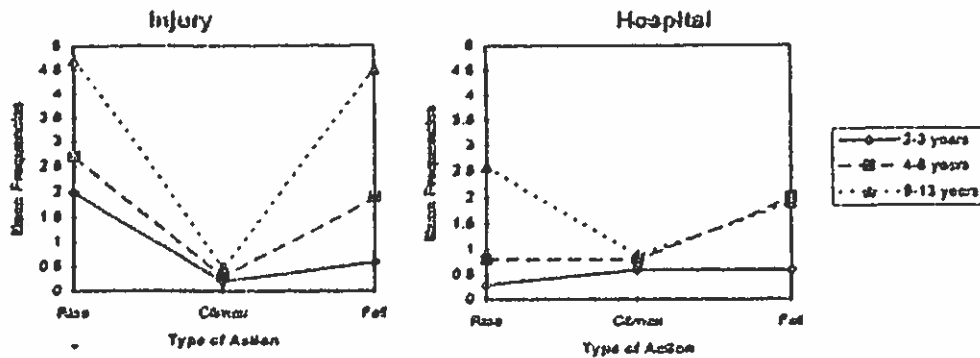


Figure 2

Mean frequencies of children's production of different types of actions (rising, climax, and falling actions).

both for the injury and hospital episodes, $F(3, 261) = 7.17$, $p < 0.001$ and $F(3, 249) = 5.00$, $p = 0.002$, respectively. Planned comparisons showed that for the injury narratives, intensifiers, internal responses and dialogue were equivalently and more frequently used than qualifiers. For the hospital narratives, all subtypes of evaluation were equivalent. As expected, children used more evaluation with age, both for their injury and hospital narratives, $F(2, 87) = 8.16$, $p = 0.001$ and $F(2, 83) = 4.38$, $p = 0.016$. There were also significant age \times evaluation subtype interactions, $F(6, 261) = 5.90$, $p < 0.001$ and $F(6, 249) = 3.97$, $p = 0.001$. For injury narratives, follow-up univariate F-tests showed that intensifiers, internal responses and dialogue became more frequent with age, and planned comparisons showed that the youngest children used fewer intensifiers than did the older two groups which did not differ from each other. Also, the oldest children used more dialogue than did the younger two groups which did not differ from each other, and the oldest children only differed from the youngest children in frequency of internal responses. For hospital narratives, dialogue became more frequent with age, and planned comparisons showed that the oldest group produced more of these types of evaluative propositions than did either of the younger groups, which did not differ from each other. To summarize, children provide more evaluative embedding in their narratives as they get older. They use intensifiers to underscore or emphasize various details, they specify internal cognitive and emotional reactions, and they report previous dialogue.

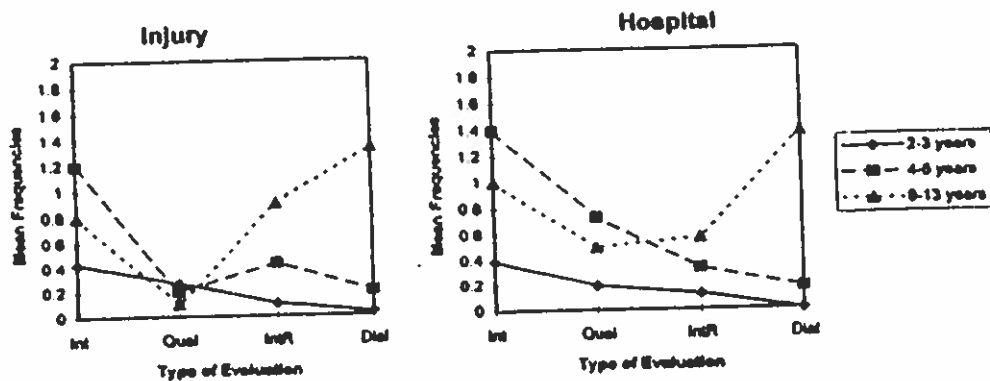


Figure 3

Mean frequencies of children's production of different types of evaluations (intensifiers, qualifiers, internal responses, and dialogue).

Overall, the 2-3-year-olds are telling very short, impoverished narratives. Of more significance, these narratives consist mostly of action propositions. The orientative and evaluative context that provides narrative coherence is mostly absent. Such contextual embedding is progressively added as children acquire canonical structural forms for narratives. Older preschoolers, i.e., 4-5-year-olds, provide approximately one orientative proposition and two or more evaluative propositions per narrative. In other words, a substantial proportion of their propositions are devoted to the provision of such contextual embedding. As children's narratives get longer with age, they continue to emphasize orientation and evaluation.

Next, the overall structure of the children's narratives were classified into various patterns. Narratives that conformed to the pattern of rising action, climax, and falling action (Labov & Waletzky's (1967) classic structural pattern) were coded as fitting the "classic" pattern. Narratives that included only rising action and climax but no falling action were termed "end-at-the-high-point" narratives, following Peterson and McCabe (1983). Some narratives included only climax action and falling action, with no rising action; this is a variant described by Peterson and McCabe and here termed "begin-at-the-high-point" narratives. The remaining narratives had no climax although they had either or both rising and falling actions. The frequencies of these patterns for both injury and hospital narratives are found in Table 2.

TABLE 2
Frequencies of Various Patterns of Narrative Structure in the Injury and Hospital Narratives of Children

Age group	Classic	End-at-hi-point	Begin-at-hi-point	No climax	Total
INJURY					
2-3 years	2	4	1	23	30
4-5 years	16	2	1	11	30
9-13 years	21	1	0	8	30
HOSPITAL					
2-3 years	1	0	3	22	26
4-5 years	2	3	11	14	30
9-13 years	17	3	3	7	30

The classic pattern of narrative structure is quite rare among the narratives of 2-3-year-olds while it is common among the oldest children. The younger the children, the more likely they are to produce narratives that have no climax. As well, the intermediate structures of ending or beginning at the high point are more likely to be found among preschoolers than older children. This developmental pattern conforms to the age differences found by Peterson and McCabe (1983). The lack of a climax in many narratives is particularly intriguing because the events inherently emphasize emotional highpoints or climactic action, i.e., the specific injury event where the bone broke or the body was lacerated (to which most children reacted with considerable emotion) and the specific treatment of the injury which took place at the hospital (which was also usually painful; most preschoolers at least reacted to it with considerable emotion).

The frequencies of the different patterns of structure were analyzed by means of a chi-square calculation. However, because of low frequencies of a number of cells, the injury and hospital data were combined, as were the two intermediate structures of end-at-the-high-point and begin-at-the-high-point. Thus, the chi-square included three categories of structure (classic, intermediate, no climax) and three age groups. The frequencies of the three narrative patterns differed between age groups, χ^2 (df = 4) = 53.86, $p < 0.001$. Follow-up χ^2 s compared each age pair, and each differed from the others at

the $p < 0.01$ level or greater. Thus, children show progressive development with age in the sophistication of the overall structure of their narratives.

Coherence and Emotionality

Next, we consider the relationships between narrative coherence and the degree of distress that the children exhibited. Recall that there were two ratings (on a scale of 1 to 6) of the children's degree of distress: their stress rating at the time of injury, and their stress rating at the time of medical treatment. As well, a composite stress measure was derived that indicated the child's highest stress rating, regardless of the episode within which that distress occurred. Thus, a child who had a stress rating of 3 at the time of injury and 6 at the time of treatment would be given a highest-stress score of 6. This was done because the two episodes of injury and treatment are causally, temporally and psychologically linked. Thus, a child who reacted to the events as highly salient and memorable and who organized them coherently in discourse may well treat both episodes of injury and hospital in similar ways because of this linkage. For these children, a single stress score indicating the highest degree of distress may be the most appropriate rating score. Recall that the injury and hospital stress scores are not significantly correlated. However, not surprisingly, both are highly correlated with the highest-stress score, partial $r_s = 0.59$ and 0.54 , $p_s < 0.001$ for the injury and hospital stress ratings, respectively. The means and standard deviations of the injury, hospital, and highest stress scores are as follows: 3.92 (s.d. = 1.66), 3.84 (s.d. = 1.89), and 4.89 (s.d. = 1.35) respectively. Thus, the children's mean distress ratings at both the time of injury and of treatment were very similar to each other.

To investigate relationships between the children's coherence measures and their stress ratings, we calculated correlations between the three stress ratings and their production of each category of proposition, i.e., of orientations, actions and evaluations for both the injury and hospital narratives, as well as the subtypes of each of these categories. Because age is such a powerful effect (and is consequently correlated with frequency data in all categories since children produce more of every type of proposition as they get older), the effect of age was partialled out. It was assumed that narratives with more orientations and evaluations were more coherent because the narrated events were embedded within a richer descriptive and emotional context.

TABLE 3
Significant Partial Correlations (with Age Partialled out) between Categories of Propositions and Injury Stress, Hospital Stress, and Highest Stress Rating

Category	Injury stress	Hospital stress	Highest stress
Orientations: Injury	0.15 ($p = 0.089$)	-	0.19 ($p = 0.046$)
Place	0.16 ($p = 0.072$)	-	0.28 ($p = 0.005$)
Background	0.17 ($p = 0.061$)	-	-
Orientations: Hospital	-	-	-
Background	0.21 ($p = 0.032$)	-	0.19 ($p = 0.045$)
Actions: Injury	-	-	-
Rising	-	-	-0.16 ($p = 0.077$)
Actions: Hospital	-	-	-
Evaluations: Injury	-	-0.17 ($p = 0.066$)	-0.15 ($p = 0.095$)
Intensifiers	-	-0.22 ($p = 0.024$)	-
Dialogue	-0.16 ($p = 0.076$)	-	-0.16 ($p = 0.078$)
Evaluations: Hospital	-	-	-
Dialogue	-0.15 ($p = 0.084$)	-	-0.25 ($p = 0.012$)

The partial correlations between the children's three stress ratings and the categories of orientations, actions and evaluations for both the injury and hospital episodes are shown in Table 3. In addition, any partial correlations between category subtypes and stress ratings that reached at least borderline significance ($p < 0.10$) are also shown. Some patterns are apparent in the data. Few of the partial correlations between hospital stress ratings and types of propositions were significant, while a number of injury stress and highest stress ratings were. This was particularly true for the narratives about the injury episode.

In terms of children's provision of orientation, higher stress ratings when injured were related to more orientative embedding of injury narratives by children; higher ratings of "highest-stress" also were related to more orientative information. In particular, children were more likely to provide information about place and background of the injury. When talking about their hospital experiences, these same children with higher injury and highest-stress ratings are more likely to provide orientative background. Thus, it seems that children who are more distressed at the time of their injury are more likely to provide the sorts of orientative embedding that will make their narratives more coherent to their listeners.

There was little relationship between how many action propositions children provided and their degree of distress. However, there were a number of relationships between how many evaluative propositions children provided and how distressed they were. Children who were more distressed at the time of hospital treatment provided less, not more, overall evaluation about their injury experiences, and in particular they provided fewer intensifiers. Children who were more upset when injured provided fewer dialogue evaluations when describing both their injury and hospital experiences. And children with greater "highest-stress" scores provided less overall evaluative context about their injury and less dialogue evaluations during both of their narratives. Note that all of these correlations are negative, i.e., the greater the distress, the less the narratives are embedded within an evaluative context. In fact, every correlation between evaluation and stress, whether it reached significance or not, was negative. This is opposite to the direction of relationship for orientative context, where greater distress is related to more contextual embedding.

The above analysis controls for the effects of age statistically. Thus, the linear variance due to age is removed. However, there may well be considerable non-linear variance and the patterns shown in Table 3 may not be reflective of all ages. Consequently, an experimental control for age was made by calculating correlations between coherence measures and stress scores for each age separately. Obviously there are many fewer children in each analysis (i.e., only 30 instead of 90) and thus the analyses have less power. However, it is important to see if the relationships we have found above (more orientation and less evaluation with higher stress) are characteristic of all of the age groups. We found that the decrease in evaluation with greater stress was indeed characteristic of all age groups, with 9-13-year-olds additionally using fewer evaluative qualifiers ($r = -0.40, p < 0.05$) as stress increased. However, the pattern of more orientative embedding with higher stress levels was only characteristic of the oldest age group. The 2-3-year-olds actually provided fewer orientative propositions, especially about background information and hospital characters, as stress level increased. Thus, in contrast to older children, the 2-3-year-olds are providing less contextual embedding about both orientation and evaluation as distress increases. For the 4-5-year-olds, the amount of orientative embedding is unrelated to stress while evaluative embedding decreases with greater stress.

Partial correlations (with the effect of age partialled out) were also calculated between the degree of distress experienced by the children at injury

and hospital treatment and the overall structure of their narratives, but the relationships were nonsignificant. Nor were any of the correlations significant between structural categories and stress ratings of each age group separately.

It is acknowledged that there are many correlations in the data that are not significant, and some reported ones are of only borderline significance. Thus, it is possible that some of the relationships are significant by chance. However, the patterns of correlations are consistent, which gives us more confidence in the conclusions we reach.

DISCUSSION

It has been suggested that canonical organization of experiences is an important factor contributing to those experiences entering into the child's life story and thus being remembered many years later (Fivush et al., 1995; Nelson, 1992). The 2-3-year-olds in this study were mostly not organizing their narratives canonically, even though the events were highly salient. Their narratives were very short; of more significance, they provided very little if any embedding of their stories within either an orientative or evaluative context. Furthermore, over three quarters of their narratives were bereft of a climax or high point. If a coherent, causally-ordered understanding of events is important for later recall (Pillemer, Picariello, & Pruett, 1994), these children are not demonstrating this understanding in their narratives since they are not organizing them around high point events. This is especially surprising since these experiences have clear-cut, highly salient and emotion-arousing high points that would seem to lend themselves to such organization.

There seemed to be a qualitative as well as a quantitative shift in the narratives of the 4-5-year-olds as compared to the younger children. Not only were their narratives twice as long but they also provided more orientative and contextual embedding to make their accounts richer and more coherent. Furthermore, the majority of their narratives had clear high points. They may not have built up to their high points appropriately or cleared the stage after them by providing concluding information, but the high points were usually there. In fact, it was the hospital narratives that were often categorized as "begin-at-the-high-point," i.e., no building to the high point occurred. However, because these narratives followed the children's descriptions of their injuries, in effect the entire injury narrative could be seen as the building

component which led up to the high point. Although we separated the two experiences in our analysis, this does not mean that they were unrelated in the child's mind. If coherent organization of experiences, i.e., embedding them within both orientative and evaluative contexts and building them around high points, fosters long-term retention then our 4-5-year-olds are more likely to recall them many years from now.

We had proposed that events eliciting different degrees of emotional response might be described differently in narrative accounts by children. In particular, we wanted to explore whether highly emotional events would be more coherently described, i.e., embedded within a more elaborated orientative and evaluative context that embellishes them with increased detail as well as situates them within the individual's life story. When the data from all the children were pooled, this is indeed what we found in terms of the amount of orientative context that children provide. Those children who were most emotionally upset by the injuries they suffered were those who embedded their accounts within a more differentiated orientative context. However, the degree of emotional distress was negatively related to amount of evaluative information: those children who were most upset provided fewer evaluative propositions when describing their experiences. Instead of the children who reacted with the greatest degree of distress being more anxious to talk about these emotional reactions, they were more likely to minimize them.

When we inspected the correlations from each of the age groups independently, a somewhat different picture emerged. The greater elaboration of orientative context with higher stress level was true only for the children in our oldest age group. There were no significant correlations between orientation and stress for the 4-5-year-olds, and those relationships that were significant for the 2-3-year-olds were all negative: the greater the stress of the children, the fewer orientative propositions the children included in their narratives. The youngest children were more likely to narrowly focus their narratives on the essentials of what happened, i.e., the actions that occurred.

In terms of evaluative propositions, at all ages the children had a tendency to provide less detail about emotional context as their degree of emotional distress increased. This is consistent with earlier analyses of children's narratives about death which highlights how relatively devoid of evaluation such narratives usually are (Menig-Peterson & McCabe, 1977-1978), as well as work on posttraumatic stress disorder which suggests that trauma often leads to a flattening of affect (Malt, 1994). While we do not suggest that the chil-

dren in this study were suffering from posttraumatic stress disorder, there are similarities between the affective experiences of some of these children and those who suffer the kind of trauma that culminates in posttraumatic stress disorder. A few quotes from the parents about their children's reactions are relevant: "She was snow white and she was holding her hand and shaking" (parent of a 2-year-old). "He was terrified, shaking and everything (parent of a 3-year-old)." "He was screaming! Bawling! Lots of blood!" (parent of a 3-year-old). "He was really, really upset He was shaking his hands and moving his body, doing things I never seen before (parent of a 9-year-old)." "It's probably fair to say he was sort of almost in shock at that point, 'cause he was crying but you know he was holding his hand and he didn't know, sort of, what had happened to him or anything like that" (parent of a 9-year-old). "If your scale goes from 1 to 6, she was at least a 10—she was off the top" (parent of a 13-year-old). (This claim about their child being off the top of the scale was made by a number of parents, and we assigned these children a rating of "6".) The pattern of correlations we found suggests that children who were highly distressed were less likely to describe the affective content of their experiences, i.e., they demonstrated a dampening of emotion akin to one of the symptoms of posttraumatic stress disorder.

Overall, our findings suggest that a highly emotional response does not necessarily result in an increase in narrative coherence. On the contrary, for preschool-aged children at least, the higher the emotional stress rating, the less they are embedded within an orientative (for 2–3-year-olds) or evaluative (for all age groups) context. It is particularly interesting that emotionality did not lead to greater coherence in light of suggestions that emotion-arousing events are the ones most likely to be recalled by adults and that experiences organized into coherent narratives are more likely to be recalled years later.

The experiences of the children may be well remembered in later years for quite other reasons than current narrative coherence. Labov and Waletzky (1967) assert that one primary function of evaluation in personal experience narratives is to avoid the deadly rejoinder of "so what" by the listener. That is, the narrator must convince the listener that the events being described are important and "reportable." However, they also suggest that some experiences are evaluative per se—i.e., they are reportable and evaluatively toned in and of themselves. For example, experiences in which someone's life was threatened are inherently highly evaluative. It can be argued that the injuries of the children are also inherently highly evaluative.

Parents also help identify those events that are important in defining the life story of their children (Snow, 1990). The experiences of the children in this study are big news in their lives, reportable to relatives, friends, neighbors, and classmates. Both the children and parents reported wide broadcasting of the news of their stitches and casts when they got home from the hospital. For most families, these experiences become part of the "family history." Thus, these stories are not necessarily coherent to begin with, but become so with retelling. McCabe et al. (1991) found that the coherence of personal experience narratives matched the teller's current linguistic competence, not their competence at the age when the events occurred. Thus, because these events are likely to be retold at various times within the family, even if these retellings are infrequent and well-spaced over the years, they will gain coherence with time. Considerable research suggests that as parents and children talk about past events, parents implicitly teach the culturally appropriate canonical forms for recalling the past (Fivush & Fromhoff, 1988; Hudson, 1990; McCabe & Peterson, 1991; Peterson & McCabe, 1992). Thus, with retelling, children will come to organize their accounts into more coherent narrative structures.

This study suggests that the coherence of a child's narrative is influenced by a number of factors, important ones of course being the child's age and mastery of conventionalized narrative forms. In fact, there are changes in coherence between the early and late preschool years that may help contribute to the offset of infantile amnesia. But another mitigating factor seems to be the child's emotional reaction to the events being described. In some ways older children's narratives may become more coherent, the more distressed the child is during the events being recounted. But in other ways the narratives may become less coherent: the children had less to say about their emotional reactions, the more extreme those reactions had been. The relationship between emotionality and coherence is not straightforward.

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