

PARENT-CHILD CONVERSATIONS BEFORE, DURING, AND AFTER A
DENTAL EXAM: LINKS TO REMEMBERING

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ABSTRACT

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The current study extends and connects two literatures: one focusing on parent-child reminiscing and the other focusing on children's independent recall of a novel activity. This study explored how parents and children discuss one such event (i.e., first dentist exam) and how those discussions shape children's remembering of the event. Additionally, the study examined consistency in the quantity and style of parent-child discourse about the event across different naturally-occurring conversations as well as during a reminiscing assessment in which parents and children discussed two past events of their choice. Twenty-eight 3- to 5-year-olds who were having their first dental exam, and their parent, participated in the study. Car ride conversations to and from the dentist, during the dental exam, and during an elicited reminiscing task were recorded. One week later children were asked to recall the dental exam. The results revealed consistency in parents' style of talk across the naturally-occurring conversations, but less consistency in children's style across these three conversations. There were few similarities between the naturally-occurring and elicited conversations in either parent or child conversational style. However, children's conversation style mirrored their parents across all the conversations suggesting that parents are guiding children how to communicate in each context. Naturally-occurring discussions were related to children's memory for the dental

exam, particularly for open-ended recall. These findings suggest preparatory talk from a knowledgeable person, and rehearsal is important in processing and remembering the event. In addition, findings suggested that parent-child narrative style in the ERT is not related to how accurate children are in reporting unrelated events. This work provides information about how everyday conversations children have with adults may influence the way children come to understand and remember novel events.

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Chapter 1: Introduction

The purpose of this study is to explore the relations between parent-child talk before, during, and after a novel and possibly stressful event and children's reactions to and memory for that event. There is considerable evidence that parent-child reminiscing about past events is a common family activity (Blum Kulka & Snow, 1992; Fivush & Haden, 2003), and that individual differences in parents' style of reminiscing predict systematic differences in children's narrative and memory skills (e.g., Fivush, Haden, & Reese, 1996). It is less well documented how these conversations might influence children's actual memories for the events discussed, particularly for events that may be stressful or are difficult-to-understand. Moreover, because individual differences in parents' reminiscing have always been assessed in experimenter-prompted conversations, it is not known whether these styles relate to differences in naturally-occurring conversations. To address these issues, this study examined associations among measures of parent-child talk during three naturally-occurring conversations about a novel event and during a traditional elicited-reminiscing assessment. In addition, the relations between these conversations and children's memories for the event were investigated.

Parent-Child Reminiscing: Parent Styles and Child Outcomes

Parent-child reminiscing literature examining children's autobiographical memory is guided by the social cultural development theory (Vygotsky, 1978; Nelson and Fivush, 2004). A central component of the theory is an emphasis on language. Language is an important cultural and social tool in the development of the autobiographical memory system. Adult-guided discourse is critical to children's

social-cognitive development. Conversations with adults help children to internalize, organize, and shape their thoughts. When parents and children reminisce about past events, the parent, as the more skillful partner in the conversation, guides the child's sharing of a personal narrative about an experience (Hudson, 1990). Initially, when children are young, parents lead the conversation with children confirming or repeating what the parents said (Fivush & Reese, 2002). Through parent-child reminiscing, the child internalizes the meaning and messages created from these interactions. Some parents provide a great deal of support for their young children to participate in the conversation through cues, reminders or prompts, whereas other parents are not as helpful (Fivush & Reese, 2002; Hudson, 1990; Nelson, 2000).

Fivush and Fromhoff (1988) identified two different styles parents use when discussing shared past events with their children that provide different levels of support: high elaborative and low elaborative. High elaborative parents ask more questions and provide more statements than low elaborative parents. In addition, they are more likely to extend the topic being discussed by asking, extending, or clarifying questions (McCabe & Peterson, 1991). Furthermore, these parents embellish more and give additional detail about people and objects than low elaborative parents. In contrast, low elaborative parents, also called repetitive parents, typically have short conversations, provide little descriptive information when discussing past events and ask the same questions over and over. Longitudinal studies have shown that parent reminiscing styles are consistent across time (Farrant & Reese, 2000; Fivush & Vasudeva, 2002; Harley & Reese, 1999; McCabe & Peterson, 1991; Newcombe & Reese, 2004; Reese, Fivush, & Haden, 1993). Parent reminiscing styles also remain

similar whether the parent and child are reminiscing about shared events or recounting non-shared past events (e.g., Reese & Brown, 2000). Moreover, parent reminiscing styles are consistent across siblings (Haden, 1998; Lewis, 1999). Thus, parent reminiscing style seems to be relatively stable and is not a simple reflection of children's characteristics. It is also worth mentioning that although most research focuses on mothers and children, high and low elaborative reminiscing styles have been identified in fathers as well (Haden, Haine, & Fivush, 1997; Reese & Fivush, 1993).

Although it is clear that parent reminiscing styles are not a direct reflection of children's behavior, the origins of these styles are still unclear. To date, researchers have been unable to identify other parent characteristics, such as education or employment status, that predict parent reminiscing style. One explanation as to why previous research has failed to find associations between parent reminiscing style and other parent characteristics has to do with sample characteristics. Specifically, parent reminiscing style may not appear to be related to parents' education or other demographic variables because most study samples have been homogenous, composed of Caucasian, middle-class families with very similar education levels (Fivush, Haden, & Reese, 2006).

Yet another explanation may be that the two parent reminiscing styles arise from the parents having different goals or purposes for reminiscing. Beyond wanting children to contribute new information and reinstate their children's memories, parents who have a high elaborative style may reminisce with their children regularly to create a shared sense of the past and to increase intimacy and relationship than

elaborative parents. Indeed, Hoff-Ginsberg (1994) has shown that mothers differ in the extent to which they elicit their children's participation in naturally-occurring mealtime conversations, and these individual differences might be related to stylistic differences in talk about the past. Consequently, another reason why researchers have been unable to identify the reasons why parents adopt different parent reminiscing styles may have to do with the way it has been assessed. It seems possible that observations of naturally-occurring interactions between parents and children might reveal differences in parent-child conversations that relate to differences in parent reminiscing style assessed in the traditional elicited conversation method. It seems possible that low elaborative parents do not view reminiscing as a way of relating to their children and therefore do not frequently engage in such conversations; as a result, when participating in an elicited reminiscing task, they may be less experienced and interested in encouraging children to participate in constructing a shared sense of the past. A related explanation is that those who use a low elaborative style of reminiscing may view the elicited reminiscing task as a situation in which they should be 'testing' their children's memories without giving much assistance in helping the child remember. In either case, low elaborative parents may be less likely to engage their children in reminiscing in naturally-occurring situations, and therefore have less experience with the types of parent-child conversations elicited in most reminiscing research. Parents classified as high elaborative in an elicited task, parents who are classified as low elaborative during the elicited task may talk less about the past.

Individual Differences in Parent Reminiscing Style

Regardless of the reasons why parents adopt different reminiscing styles, there is considerable evidence these styles are related to differences in children's narrative and memory skills (e.g., Buckner & Fivush, 2000; Fivush, 1998; Peterson & Roberts, 2003). More specifically, children of parents with an elaborative reminiscing style tend to recollect more details when reminiscing with their parents than children of parents who have a low elaborative reminiscing style. For example, Fivush and Fromhoff (1988) found a positive correlation between the amount of maternal elaboration and their 2.5-year-old children's memory performance during parent-child reminiscing. The children of elaborative mothers provided significantly more information about the past events than children of low elaborative mothers, most likely because children of high elaborative parents are given more information and evaluations to cue their recall and reinstate their memory of the event (Fivush, 1991; Nelson, 2000).

The differences between children of low and high elaborative parents in memory skills are not specific to conversations with the parent (e.g., Harley & Reese, 2000). Parent reminiscing style also predicts children's abilities to remember and talk about past events with other adults who were not present during that event (Reese & Brown, 2000). Likewise, children's reminiscing abilities mirror their mothers' reminiscing style even when an experimenter deliberately asks children about a past event in a different reminiscing style from that of the mother (Tessler & Nelson, 1994). Also, in a study by Harley and Reese (1999), children of high elaborative mothers, as identified at 19 months, provided more memory elaborations (new

information about the event discussed) than children of low elaborative mothers when recounting with an investigator at 25 and 32 months of age. Moreover, children's memory elaborations with their mothers at 19 months predicted their memory elaborations with an experimenter at 25 months, and, similarly, their elaborations with their mothers at 32 months predicted their memories with an experimenter at 40 months. These findings indicate that over time and across conversational partners children's narrative and memory skills are predicted by their mothers' reminiscing styles (e.g., Fivush, 1991; McCabe & Peterson, 1991). Thus, the effect of parent style on children's memory performance does not seem to be a transient child response to what the mothers do during the conversation itself; rather, children seem to be learning narrative and memory skills over time that generalize to other situations when their mothers are not present.

Experimental manipulations of parent reminiscing style suggest that the associations between parent reminiscing style and children's memory skills are not likely due to genetic or other factors that the parents and children (and siblings) have in common, such as temperament. Boland, Haden, and Ornstein (2003) recruited a sample of repetitive-style mothers of 3.5-year-olds and trained only half of them to use the elaborative conversational style. In addition to receiving a training pamphlet, mothers in the training group watched a video tape that trained them to use specific conversational techniques (e.g., elaborative questions and associative talk). Following the training video, they participated in a pretend camping event with their child. An experimenter then interviewed the children about their memories of this event 1 day and 3 weeks later. They found that children of trained mothers made more

elaborations in memory conversations with the experimenter than children whose mothers were not trained to be elaborative. This study indicates even if parents do not have an elaborative reminiscing style they can be trained to be more elaborative, and this training in turn influences their children's memory for the discussed event suggesting an improvement in their memory skills. Although it may be surprising in the Boland et al. (2003) study that children's memory skills were enhanced over such a short time period, one caveat to the study is that children's memory skills were only assessed for the elicited event. Thus the manipulation of parents' style may not be durable and the effects may only be limited to that event. On the other hand, Peterson, Jesso, and McCabe (1999) found much longer- term benefits of parent style training: children of trained mothers produced more memories with a researcher than the control group when assessed two years after the training. These studies indicate that training low elaborative parents to be more elaborative leads children to have better memory skills, and supports claims about a causal relation between parent reminiscing style and children's memory skills.

Research also indicates that individual differences in how parents reminisce with their children are related to differences in children's emotional talk while narrating past events (e.g., Adams, Kuebli, Boyle, & Fivush, 1995; Fivush, Berlin, Sales, Mennuti-Washburn, and Cassidy, 2003; Sales and Fivush, 2005). Previous studies indicate that when parents use more emotional terms during reminiscing, so do their children. Although Fivush (1994) predicted that when discussing past events with their children, "elaborative parents provide more information about children's emotional reactions than do low elaborative parents" (p. 144), the empirical findings

related to this issue have been mixed. Some studies have shown positive associations between parents' use of elaborations and emotions such that elaborative parents include more emotions (e.g., Liable, 2004), whereas other studies have not found a relationship between parent elaborations and parent emotions (e.g., Fivush & Vasudeva, 2002). However, there is considerable evidence that across different contexts and over time parents who talk about feelings, thoughts, and evaluations while reminiscing with their children have children who also include feelings, thoughts and evaluations in their narratives about past events (e.g., Ackil, Van Abbema, & Bauer, 2003; Adams et al., 1995; Fivush, Berlin et al., 2003; Sales, Fivush, & Peterson, 2003; Sales & Fivush, 2005). In other words, the ways in which mothers use emotional terms are related to the way in which children use emotions when they talk about past events. In addition, there is evidence that discussion of emotions related to an event helps children understand, evaluate, and further process the event (Ackil et al., 2003; Fivush, Berlin et al., 2003; Fivush, 1993; Fivush, 2001; Sales & Fivush, 2005).

Parent-Child Conversations: Links to memory

As discussed above, extensive research on parent-child reminiscing about past events indicates that parents, specifically mothers, play a role in guiding young children's recall of past events. Through parent-child reminiscing, children learn general skills for organizing and recalling personal experiences (Nelson & Fivush, 2000). It seems likely that these conversations might also influence children's memory for the specific events discussed, but surprisingly few studies have actually examined this possibility.

The constructivist memory framework may shed light on this issue.

Constructive memory is a process of integrating information from interactions with others, thoughts, and perceptions. More specifically, the constructivist memory framework indicates that memory representations are not encoded or recalled verbatim, but rather they are “constructed” by combining the to-be-remembered stimulus with knowledge, attitudes, suggestions from others and other factors (e.g., Bartlett, 1932; Greenhoot, 2000; Sutherland, Pipe, Schick, Murray, & Gobbo, 2003). For example, during encoding, relevant prior knowledge may influence how a child understands and interprets events. Similarly, when constructing a memory children may use prior knowledge to elaborate on the to-be-remembered stimulus or make inferences to fill in gaps. The constructivist memory framework also suggests that once constructed, memories are dynamic and can change over time. Specifically, memories can be reconstructed after the initial encoding and storage in response to changes in relevant knowledge, attitudes, emotions, as well as exposure to post-event information (e.g., Christianson, & Safer, 1996; Greenhoot, 2000; Ross, 1989). For example, during recall children may make inferences based on knowledge or beliefs to fill in forgotten information. Of course, such memory reconstruction can also lead to distortions, illusions and errors (e.g., Johnson, 2006; Johnson, Hashtroudi & Lindsay, 1993; Leitchman & Ceci, 1995, Ross, 1989). Consistent with this view of memory as a constructive process, a large body of suggestibility research indicates that exposure to post-event information may impact recall of an event. For example, both adults and children are susceptible to including false post-event information in their recollections, especially when asked misleading questions (e.g., Roebbers &

Schneider, 2000). Moreover, developmental research on suggestibility indicates that young children may be more susceptible to suggestions than older children and adults (Ceci & Bruck, 1993; Nelson, 2000).

The constructivist memory framework and the suggestibility literature propose that information introduced during conversations about past events could be incorporated into participants' recollections. Consistent with this argument, research on collective remembering indicates that during conversations about the past, different "versions" of past events might arise, leading to the reconstruction of individual participants' memories for those events (Middleton & Edwards, 1986; Rubin, 1996; Schudson, 1996). Similarly, Haden et al. (1997) suggest that during parent-child reminiscing, parents help children develop their own version of what happened, which further assists children in learning how to organize what they remember into a coherent, meaningful story. For example, parents may help children to recall what happened by reinstating portions of the event, elaborating in more detail important components of the event, highlighting the event in temporal order, or giving the child memory cues to remember more about the event information. These parent-guided activities during reminiscing could play a major role in shaping children's subsequent recollections of those events

Although it seems likely that parent-child post-event conversations influence children's memory, there is little empirical evidence regarding how typical parent-child reminiscing shapes children's memories for the specific events discussed. One reason for the dearth of empirical evidence is that most studies on parent-child reminiscing have not documented the events themselves; therefore, few studies have

“baselines” against which to compare the children’s memories. The lack of baselines makes it impossible to examine accuracy in children’s memories, and to determine how reminiscing influences children’s accuracy in recalling the event. One exception to this pattern is a study by Leichtman, Pillemer, Wang, Koreishi, and Han (2000), which documented a unique day at preschool and found some evidence that post-event discussion between parents and children enhanced children’s memories for reviewed aspects of the event. Leitchman et al. (2000) had mothers and children discuss a special event that had occurred earlier in the day during preschool, for which the mother was not present. Children were then given a memory interview about the event 3-weeks later. Children remembered more of the items that had been discussed with their mothers than the items that had not been discussed. Furthermore, children whose mothers were more elaborative when discussing the event provided more event details during the memory interview. Unfortunately, the Leichtman et al. (2000) study had a small sample size of 15, preventing regression analyses. However, the findings do suggest that children’s reconstructing the event in a detailed manner is beneficial to the children’s event recall.

The way in which parent-child conversations are carried out *during* shared events might also shape the way children understand and remember events. During a novel event, young children may look to their parents for guidance and information about what is happening or about to unfold. Parents may guide children’s attention, provide cues for understanding the event, and give personal interpretations and these activities may influence how children encode the event. Two studies have reported connections between parent-child conversations as events unfold and children’s

memories for those events (Tessler & Nelson, 1994; Haden, Ornstein, Eckerman, & Didow, 2001). In Tessler and Nelson's study, 3- to 3.5-year-old children and their mothers visited a museum, and children were asked to recall the experience to an experimenter one-week later. Their findings indicated that children only recalled items that had been discussed during the event by both the mothers and children. In a second study, Tessler and Nelson had 4- to 4.5-year-old children and their mothers take pictures during a walk down three unfamiliar city streets. In later memory interviews, the children were shown the photos and were interviewed about them. Unlike the first study, items that either the mothers or children discussed during the event were then more likely to be recalled during the memory interviews than items that were not discussed. Tessler and Nelson suggest that differences between the two studies' findings could be attributed to children being older in the second study, and the fact that the second study provided the pictures as a cue for the event (walking down a street versus visiting a museum). Regardless, both studies indicate that conversations that take place as an event unfolds influence children's memory for that event. More specifically, talk about the event may help children to verbally encode the event creating a stronger memory representation which would benefit children in remembering the event later.

Haden and colleagues (2001) recently conducted a longitudinal study examining parent-child interactions during experimenter-elicited activities. Mothers and their 30-month-old children participated in a camping activity, six months later participated in a bird-watching activity, and six months after that took part in an ice cream shop activity. The children were asked to recall the events with an

experimenter who was not present both one day and three weeks afterwards. In their study, items that were non-verbally jointly attended during the event (i.e., both the mothers and children attended to the item at the same time but neither said anything about the item) or verbally jointly attended (i.e., both mothers and children attended to and conversed about the item) were remembered better than features that only the mothers or children attended to. In addition, Low and Durkin (2001) examined mother-child talk while watching a television show and their talk while reminiscing about the show 4, 8, and 12 months later. They found that children whose mothers were highly elaborative watching a show provided more information about the show's story line at all three time-points. Thus, like the results of Tessler and Nelson (1994), these findings suggest that it is important to consider how events are jointly talked about as they occur because these conversations influence children's memory for those events.

Just as parent-child talk during and after an event might influence children's memories for the event, it also seems likely that parent-child conversations about an event *before* it happens shows that prior knowledge influences the encoding and retrieval of memories (e.g., Bartlett, 1932; Chi & Ceci, 1987; Greenhoot, 2000). Indeed, studies have shown that adults and children have encoding and retrieval advantages when they have an existing knowledge base relevant to the to-be-remembered information (e.g., Baker-ward, Gordon, Ornstein, & Larus, 1993; Bransford & Johnson, 1972; Chi & Ceci, 1987; Sutherland, Pipe, Schick, Murray, & Gobbo, 2003). For example, Sutherland et al. (2003) found that when young children were given advanced information about a specific event staged by an experimenter,

they remembered the event better both immediately and after a 4 month delay, whereas general discussion of the topic without the event-specific information neither enhanced memory reports nor facilitated the integration of event information. Thus, conversations that take place before an event might influence children's memories because they "prime" children to attend to particular features of the event or convey knowledge regarding what is about to happen. These conversations may help children establish a knowledge base or prior knowledge about the event, which in turn children could use when encoding new information during the event. In addition, parent-child discussions that organize and label future events may guide children's understanding and encoding of the event and guide children's encoding of the event and their later recollections (e.g., Fivush et al., 1997; McGuigan & Salmon, 2004). Studies suggest that labeling enhances encoding and memory because the material is processed for meaning (e.g., Brown & Craik, 2000). Therefore, conversations about a future event might influence children's memory for that event.

Although the effects of pre-event parent-child talk has not been examined in relation to memory, research indicates that parent-child conversations about future events are common and that preschoolers have some understanding of future events (Hudson & Sosa, 1995; as cited in Hudson, 2001; Hudson, 2002). Moreover, recent research by McGuigan and Salmon (2004, 2005) has shown that, when an experimenter asked questions to elicit children's participation before the event, children's memory errors decreased (although there were no effects on accurate recall). McGuigan and Salmon (2005) found correct recall was only increased when children were shown photos along with the discussion. The researchers suggest that

the lack of improvement in children's recall could be because children were not talking about the event enough and not internalizing the information. Another explanation may be that children were not able to connect information they were told about the event beforehand to the event itself, as this may be particularly difficult for young children to do (e.g., Muracher, Pipe, Gordon, & Owens, 1996; Sutherland et al., 2003).

There is some evidence that suggests that talk before an event may not be as beneficial to memory as talk during and after an event. One experimental study has manipulated adult-child talk before, during, and after a staged event, and only found effects of elaborative talk that took place during or after the event (McGuigan & Salmon, 2004). In this study by McGuigan and Salmon (2004), three and five-year-olds participated in a scripted, experimenter-staged event in which an experimenter was elaborative before, during, or after the event. There was also a condition in which children heard 'empty' talk during the event and did not participate in pre-event or post-event discussions. When an experimenter was elaborative after the staged event, three and five-year-old children remembered more about the event compared to the "empty" talk condition, but only five-year-olds also benefited from elaborative talk during the event compared to the "empty" talk condition. As mentioned previously, children given elaborative information before the event made fewer errors during the memory interview compared to children given no preparation, although they did not remember more information about the event. These findings suggest that parent elaborative conversations might positively influence recall. However, because McGuigan and Salmon did not include a condition with repetitive talk, it is possible

that it is just be the quantity of talk about an event, irrespective of the style, that influences the quantity of children's recall.

To investigate the influence of narrative style on children's recall, Conroy and Salmon (2006) manipulated the style of an experimenter's talk with 5- and 6-year-olds about a staged event after it had occurred. Conroy and Salmon found that children who discussed the event with an experimenter in a high-elaborative style three days after the event provided more information in a memory interview that took place another day later than children in a control group who did not discuss the event. But the performance of children in the high-elaborative group did not significantly differ from that of children in a low-elaborative condition, even though children in the low elaborative condition did not perform better than the controls. Although these patterns suggest that any style of talk after an event supports children's memory, the authors also suggested that the lack of significant differences based on style could be due to insufficient statistical power.

The studies by Salmon and her colleagues suggest that how adults discuss events during and after the events may influence what children recall, but it is important to note that these studies focused on experimenter-controlled events and discussions, and the findings may have limited application to our understanding of the way parents might shape children's memories in natural contexts. For instance, the style the experimenter used may not have matched the style used by individual children's primary caregivers. Furthermore, reminiscing research has focused on the importance the on-going relationship between parents and children in children learning how to reminisce and adapting their primary caregivers reminiscing style

(e.g., Reese & Brown, 2000). Thus, the findings of these studies may not apply to parent and child conversations, particularly those in a natural context.

In sum, research on the malleability of memories and constructive memory processes suggests that parent-child conversations about events might shape children's memory whether they take place after, before or during the event, but there is currently very little research on this issue. Based on previous research, it is likely that when adults provide information about what is going to happen, what is happening, and what happened, children may have a more accurate, complete, and organized memory representation of the event. Previous research, however, has not examined how naturally-occurring parent-child conversations at all three time points influence children's memory for events. In addition, it is unclear how parent reminiscing styles identified in the traditional assessment relate to parent's style during naturally-occurring talk. To address these issues, the present study examines naturally-occurring parent-child conversations in preparation of, during, and after an event, and the degree to which these conversations are related to children's understanding and memory for the event. The study additionally explores linkages between parent-child talk during these naturally-occurring conversations and during an "elicited" conversation. Further, associations between reminiscing styles in the elicited conversations and children's memories for the event discussed during the naturally-occurring conversations are examined.

Present Investigation

This investigation focuses in particular on how naturally-occurring parent-child conversations might influence children's memories for a novel and potentially

stressful event. Three to 5-year-old children going to their first dental visit, and their primary caregivers, were recruited to participate in the study. Parent-child conversations that took place shortly before, during and shortly after this event were examined. One week after the dental exam, a researcher visited the parents and children, at which time the children were asked to recall the event. This event was chosen because children may have an especially hard time understanding this type of event. In addition, the first dental visit may lead parents to talk with their children about the visit both before and after it occurs. By discussing a unique and potentially stressful event with their children, parents may help them better understand and cope with the event (Sales & Fivush, 2005). Indeed, children may depend on their parents for cues to frame the event and to indicate the meaning and severity of the event. Talk before an event may help children to gain more knowledge and assist in encoding during the event. Talk during the event may guide children's attention to important aspects of the event and encode the experience. While reminiscing after the event, parents and children may reinstate and reconstruct what happened. Discussions of emotions at all of these time points may help children to understand, evaluate, and further process the event. Thus, the quantity and style of parent-child discussion of the exam at all three time points should be related to children's memories of the exam. For example, children who discuss more components of the dental exam with their parents before, during and after the event should remember more about the exam than children who discuss fewer event components with their parents. Additionally, the particular components discussed should be more likely to be remembered than components not discussed.

Table 1.
Study Design: Time-line (left to right)

<i>Recruitment</i>	<i>Prior to Dental Exam</i>	<i>Day of Dental Exam</i>	<i>Follow-up visit</i>
Clinic mails flyer to family	<ul style="list-style-type: none"> • Parent signs consent form • Parent given audio cassette recorder, vest, and blank tape 	Parent records car-ride to the clinic	<ul style="list-style-type: none"> • Elicited Remiscing Task (audio-tape) • Video-tape child's memory interview
Family contacts researcher about study		At clinic: <ul style="list-style-type: none"> • Parent fills out forms • Dental exam video taped • Hygienist fills out stress form 	
Appointment made to meet family		Parent records car-ride from the clinic	

The assessment of parent-child talk before and after the event adopted in the current study involved audio-taped recording naturally-occurring parent-child conversations that took place during the car rides to and from the event. Videotape recording of the actual dental visits were collected as well. The study design is shown in Table 1. This type of methodology has been used in other research on parent-child conversations. In particular, Marvin (1995) used tape-recorded conversations of parent-child discussions in a car to explore children's use of time referents in talk with their parents. She found that children's references to the past during the car ride home from preschool were frequent and related to experiences that happened at preschool that day. For the current study, assessments of naturally-occurring parent-child talk during the event were obtained by recording the event itself. The assessment of talk during the examination itself included talk by adults in addition to the parent (i.e., dentist and hygienist), as this could also affect how children remember the event.

Another goal of the study was to examine consistency of talk style across the three naturally-occurring conversations. There is a vast amount of evidence that parent and child reminiscing styles are related, but studies have not examined these associations (within and between person) during naturally-occurring conversations across multiple time points (i.e., before, during, and after). Haden et al. (2001) reported asking parents to reminisce one time with the child about the elicited activity between the parent and child (i.e., bird watching), but associations between styles identified in the reminiscing task and the elicited activity were not reported. Thus, it is unknown how consistent parent-child conversations are across time with regard to quality and quantity. By examining consistency across time, the study may better describe and evaluate the effects of conversational timing on memory.

For the current study, in addition to recording naturally-occurring conversations, parents and children participated in the elicited reminiscing task used in previous parent-child reminiscing studies (e.g., Fivush & Reese, 2002). The current study included a more traditional elicited reminiscing task because most other studies on parent-child reminiscing have relied on elicited reminiscing tasks in which parents are explicitly asked to discuss the past with their children (e.g., Tessler & Nelson, 1994; Haden & Fivush, 1996). These studies have found associations between parent and child narrative style characteristics. For example, during these conversations, when parents are more elaborative, so are their children. It was expected that previously-demonstrated associations between parent and child reminiscing style would be replicated in the current study.

Given that there has been little research in the area, the researcher was especially interested in examining the links between elicited conversations and the naturally-occurring talk. The current study may provide information about the degree to which parent-child talk in a more naturalistic assessment resembles that in more traditional elicited assessments. This analysis might also provide more information about the differences between high elaborative and low elaborative parents than has been revealed by previous research. Although it is possible that high and low elaborative reminiscing styles may be identified in naturally-occurring talk, it also may be that parents classified as low elaborative in the elicited task simply reminisce with their children less frequently about upcoming or past events than elaborative parents in naturally-occurring conversations. This finding would suggest that the elicited reminiscing task in which parents are asked to discuss a specific event with their children may be a less ordinary activity for low elaborative parents than for elaborative parents. Thus, parent styles in this elicited conversation were examined in relation to the characteristics of the naturally-occurring conversations.

Because previous research has shown that elaborative reminiscing (during the traditional elicited reminiscing task) is associated with better child memory skills in general (e.g., Fivush, Reese & Haden, 1996; Reese & Brown, 2000), another goal of the study was to extend this previous finding to a context in which the accuracy of recall can be examined. Previous reminiscing studies have examined the elaborateness, but not the accuracy, of children's recall. In the current study, because the details of the to-be-remembered event were documented on videotape, it was possible to look at whether the parent-child conversational style during the elicited

reminiscing task was related to the accuracy of children's memory performance in addition to elaborateness (for an unrelated event; i.e., the dentist exam).

In sum, parent and child talk during naturally-occurring conversations before, during and after an event were examined in addition to parent and child talk in an elicited conversation. There were several specific aims of the study. First, the relations between parent and child quality and quantity of talk measures from each of the three naturally-occurring conversations (before, during, after a unique event) were examined. In addition, the study also examined within person associations across time points. The study also examined associations between parent reminiscing styles during naturally-occurring talk and during a traditional elicited-reminiscing assessment. In addition, the study addresses how these four conversations relate to children's memories for that event. The parent reminiscing styles during all four conversations and children's memory for a unique event were examined to better assess the role of parent-child discourse and children's narrative and memory skills.

Based on previous research, it is possible that a number of child characteristics may lead to variation in parent-child conversations and children's memory, and information about some of these characteristics also were collected during the study to be used as covariates in the analyses. For instance, as discussed earlier, studies have found age differences in parent-child talk, such that with age over time children are increasingly able to contribute more to parent-child conversations about past events, providing more details, evaluations, and information about temporal order (Ackil et al., 2003; Fivush et al., 1996; Nelson & Fivush, 2004). There also is considerable evidence that older children form stronger, more easily

retrieved memories for events than younger children (e.g., Baker-Ward, Gordon, Ornstein, Larus, & Clubb, 1993; Ceci & Howe, 1978; Ornstein, Naus, & Stone, 1977). Previous studies in the parent-child reminiscing literature have also found that parents reminisce more elaboratively with girls than with boys, and girls are more descriptive than boys when recalling past events (e.g., Adams et al., 1995; Haden et al., 1997; Reese et al., 1996). Finally, research has shown that children's advancements in language skills are positively correlated with characteristics of parent-child conversations about the past, as well as children's abilities to recall events (e.g., Burgwyn-Bailes et al., 2001; Fivush et al., 1995; Haden et al., 1997). Thus, in the current study information about children's age, gender, and language skills was collected and these covariates were initially included in all models in an attempt to account for additional variability in parent-child conversations and memory.

Specific Hypotheses

1. Based on the previous literature using the Elicited Reminiscing Task (ERT), it is expected that parent and child conversation measures will be interrelated within each conversation (i.e., the three naturally-occurring conversations and the ERT), particularly for parent and child elaborations.
2. For both parents and children, there will be associations between measures of the amount and style of talk about the dental exam collected before, during, and after the event. In other words, the characteristics of parent and child talk will remain stable across the three naturally-occurring conversations.

3. Differences in parent narrative style characteristics identified in the elicited reminiscing task will be related to differences in conversational characteristics before, during, and after the dental exam. More specifically, there will be relations between parent elaborations across the different conversations, but the same pattern may not follow for repetitions.
4. Naturally-occurring talk before, during and after the exam will be related to children's memories of the exam. Specifically, children whose conversations include more overall talk about the exam prior to, during, and after the exam will remember more about the exam than children whose parents talk less about the dentist during each time period. Likewise, more elaborative or detailed conversations will be associated with children reporting more information during the memory interview. Moreover, the particular details of the dental exam that are discussed during the conversations will be more likely to be remembered than details that are not discussed. Finally, discussion of procedures that did not actually occur during an individual child's exam may be related to more memory errors.
5. Parents' narrative style during the elicited reminiscing task will be related to children's recall of the dental exam such that parents who are more elaborative will have children who not only provide more details about the exam but have higher proportions of accurate recall.

Chapter 2: Method

Sample

Three- to five-year old children scheduled for their first visit to the dentist in the Lawrence, Kansas area, and their primary caregivers, were recruited for the study. No exclusionary criteria were used except that both the parents and children had to be fluent in English. Recruitment of the sample was primarily coordinated with the Douglas County Dental Clinic (DCDC), a non-profit community dental clinic that provides comprehensive general dental care to underserved members of the community. The patient population of the DCDC includes children that have public health insurance (Medicaid/HealthWave) and uninsured adults. Individuals with private third-party insurance (e.g., Blue Cross, Delta) are not eligible to be seen at the clinics. The staff at the DCDC clinic agreed to assist with this project. A coordinator at the DCDC mailed out flyers to 3- to 5-year-old children scheduled for their first dental exam (Appendix A). In addition, flyers were sent to the families of new children enrolling in Head Start in Lawrence and to families served by other child service programs (e.g., Success by Six) because these children are frequently eligible to be seen at the DCDC. The flyers asked potential participants to contact the researcher for further information about the study. Once parents contacted the researcher, she arranged to meet them to obtain informed consent for participation for the study. Additional participants who were scheduled for exams at private dental clinics were recruited by distributing flyers with permission in community grocery stores, religious organizations, and day care centers, and an advertisement was placed in a Lawrence-based monthly parents' magazine. Letters and follow-up phone calls

were placed to Lawrence private practice dentists to find out if they would be willing to assist. Four additional clinics agreed to send out flyers, pass along information to potential participants, or permit participating children's exams to be videotaped.

The final sample included 28 3- to 5-year-old children and their primary caregivers. The average age of children was 48.79 months (*range* = 36 – 64 months). Twenty-four of the children had examinations the DCDC, and four were seen at other Lawrence area dentists whose offices do not have insurance restrictions. There were 16 girls and 12 boys in the sample. Twenty-one of the children in the sample were Caucasian, two children were African American, one child was Hispanic, one child was Asian American, one child was Native American, and two children were classified by their parent as having a mixed ethnic background. The children came from diverse socio-economic backgrounds. The mean level of education achieved by both the mothers and fathers was 14 years, but education level ranged from completion of grade 8 to completion of graduate school (masters or PhD). Approximately 36% of the mothers and 43% of the fathers (for whom information was obtained) had earned a bachelor's degree or higher. Information about the father was not obtained for four of the children.

Procedure

Prior to the dental exam. Once parents indicated interest in the study, the researcher arranged to meet the parent at the location of his or her choice (e.g., home or workplace) to obtain informed consent (Appendix B) and to give the parent an audio-recorder and blank tape prior to the dentist visit. All but one parent asked the researcher to come to the home.

Day of the dental exam. On the day of the dental visit, the parents audiotaped the car trip to the dental clinic. The parents pressed the record button when placing their children in the car. The recorder was placed on the floor of the car or in another location out of the child's reach. Parents turned off the recorder after arriving at the dental clinic. Car rides to the dentist averaged 10 minutes and 29 seconds (*range* = 2:05-21:28). For one child the tape recorder battery died after 2 minutes and 47 seconds, but the parent indicated that the car ride lasted only a few minutes after the battery had died. In addition, one family did not record the car ride as they were recruited for the study on the day of the child's dental appointment. The conversation recorded during the car ride prior to the dental exam will be referred to as the Before Conversation.

Once they arrived at the dental clinic, the families were greeted by a research assistant. At this time, the researcher obtained the children's verbal consent to participate (Appendix C). Parents were given a brief questionnaire containing questions about family demographics, the children's experience with dentists, and whether the parent planned to give the child a reward for going to the dentist (Appendix D). The parent questionnaire also included questions about the children's stress level before, during, and immediately after the visit. Parents were asked to complete the "before" stress question in the waiting room, and the "during" and "after" stress questions just before leaving the dental clinic. Each of these three stress questions asked parents to rate their child's stress or anxiety level on a 5-point Likert scale, with 1 being "no anxiety" and 5 being "the most anxious the child has ever been."

During the dental exam, most children ($n = 21$) were accompanied by parent in the exam room. Ten of the children has been to the dentist before with other family members but were not examined at that time. Ten of the families offered rewards to their children for going to the dentist.

Because the dental exam varied somewhat from child to child, the event was videotaped to get an accurate record of the procedures carried out on each child and to record parent-child talk and talk by the clinic staff (i.e., hygienist and/or dentist). The talk that took place during the dental exam will be referred to as the During Conversation. The videocamera was turned on after the child's health history was taken and was turned off after the exam was completed. Most children ($n = 19$) were first examined by a hygienist and were then examined by a dentist. Four children, however, were only seen by a dentist, and five children were seen only by a hygienist. Sixteen children had their teeth cleaned, and seven children had dental problems (i.e., cavities) needing a follow-up visit. For children who saw both the hygienist and dentist, the exam lasted an average of 19 minutes and 41 seconds ($range = 9:30-50:03$). For children who saw only one person, the exam lasted an average of 8 minutes and 30 seconds ($range = 2:02-20:08$). For one child who only saw the hygienist (and did not receive a cleaning), the videocamera was accidentally turned off approximately 4 minutes into the exam, prior to its completion. The parent was asked after the home visit what procedures had occurred, and which features had been discussed. The recording time for the visit included while the child was waiting in the dentist chair for the hygienist or dentist.

Although there were some variations from child to child, a set of 28 typical examination components, grouped into seven broader categories, were identified through consultation with the hygienists and dentists. It is possible, however, that a child could have more features in addition to the 28 pre-defined features. Upon review of the videotapes of the dental examinations, three more features were added as typical features, but these features were not specifically asked about. Moreover, these features were consistently discussed during the exam and most children spontaneously reported them during the memory interview. Table 2 provides a brief outline of the 31 event components (see Appendix E for a more complete description and listing of other possible features children recalled during the memory interview).

Table 2.
Dental exam procedures

<i>Event categories</i>	<i>Adminstered by:</i>	<i>Specific components or features</i>
Start of exam	Hygienist	Child sits in chair, child wears bib, hygienist wears gloves, chair moves, child leans back in chair, child asked to smile, child wears sunglasses
Oral exam	Hygienist	Hygienist turns on light, child opens wide, hygienist uses mirror, hygienist counts teeth, hygienist pokes teeth/uses tooth explorer
Polish/Cleaning	Hygienist	Child picks flavor, tickly brush on child's teeth, spray water in child's mouth, suck water from child's mouth with Mr. Slurpy the straw
Fluoride treatment	Hygienist	Paint brush treatment or football player mouth guard treatment
X-ray	Hygienist/Dentist	Child wears jacket, x-ray machine in mouth, dentist looks at pictures of teeth
Additional oral exam	Dentist	Gloves on, counts teeth, uses pick, pokes teeth, fingers in mouth
Prize	Dentist	Child gets toothbrush, toothpaste, sticker, small toy, floss, and book

Table 3.
Summary of parent and hygienist/dentist ratings of children’s stress levels before, during and after the dental exam.

	# of children assigned each rating					Mean
	1	2	3	4	5	Rating
Before exam						
Parent	11	6	10	4	0	2.04
Hygienist/Dentist	5	11	11	0	1	2.32
During exam						
Parent	8	3	9	4	1	2.48
Hygienist/Dentist	4	17	4	1	2	2.29
After exam						
Parent	18	4	4	2	0	1.64
Hygienist/Dentist	13	10	4	1	0	1.75

After the exam, the primary person who examined the child (i.e., hygienist or dentist) was asked to complete the same stress level questions about the child’s stress before, during and after the exam that were administered to the parent. Table 3 summarizes the ratings of children’s stress levels provided by both the parent and the hygienist/dentist. For most children, for both parents and the examiner rated them as having some or limited anxiety at the three time points. As shown in Table 3, most children were rated as having some anxiety before the exam, limited anxiety during and no anxiety afterwards. The hygienist scored very few children at any time point with ratings higher than 3 ($n = 4$). For most children the parent and hygienist scores were within 1 point of each other, indicating that their observations of the children’s anxiety/stress were similar. During the dentist exam, parent’s and hygienist’s ratings were associated with each other ($r = .67, p < .001$). Parents’ scores at all three time points were correlated ($r_s = .39, p_s < .05$). In addition, the hygienists’ scores at all three time points were correlated ($r_s = .47, p_s < .02$). The primary examiner also responded to an additional question about how nervous or anxious the child was

compared to other children their age using a 5-point Likert scale, with one being “calmer than all” and five being “one of the worst cases of anxiety or nerves.” Twelve children received a score of 3, eleven children received a score of 2, two children received a score of 4, two children received a score of 1, and no children were scored of 5.

Finally, once the exam was completed, parents audiotaped the car trip the their next destination. Car rides leaving the dentist’s office averaged 10 minutes and 52 seconds (*range* = 1:27-21:25). One child’s tape recorder was accidentally shut off before completion of the car ride after 1 minute and 5 seconds. The conversation recorded after the dental exam will be referred to as the After Conversation.

Home/Laboratory visit. Approximately one week after the exam ($M = 8$ days), the researcher visited with the parents and children in their home ($n = 27$) or a KU laboratory ($n = 1$), depending on the parents’ preference. First, parents and children participated in an Elicited Reminiscing Task in which the parents nominated two unique past events that they had experienced with their children to discuss on videotape. The parents then filled out a Dental Discussions questionnaire about discussions of the exam that had taken place over the delay. The questionnaire took about five minutes to complete. While the parents completed the questionnaire, the children participated in a Memory Interview in which the researcher asked them to recall the visit to the dentist. Finally, measures of the children’s expressive and receptive language skills were administered. The entire visit took about 45 minutes to 1 hour to complete. The first twenty families recruited were given 20 dollars to compensate them for their time. Due to an increase in funding, the last eight families

recruited were given 40 dollars, instead of 20 dollars, as an additional incentive to participate in the study. In addition, all children were given a small toy for participating in the study.

Elicited Reminiscing Task. The Elicited Reminiscing Task (ERT) was designed to be comparable to those used in previous studies of parent-child reminiscing (e.g., Fivush & Reese, 2002; Haden et al., 1997). Parents were asked to select and discuss with their child two recent shared events that were unique and lasted no more than a couple of hours (Appendix G). For example, they could talk about a trip to the zoo, museum, or swim-park. There was no time restriction for this conversation, and the researcher left the room for this part of the session. Conversations were audio-taped.

Memory Interview. The Memory Interview (Appendix H) followed a standard protocol and was videotaped to get an accurate record of the children's responses. The prompts were hierarchically ordered ranging in specificity from open-ended probes to yes-no questions. Children were first asked open-ended questions probing for their memories of the components of the exam. All children were asked a general question first ("What happened when you visited the dentist a week ago?"). Children were then asked more specific open-ended questions (e.g., "What happened when you first sat in the chair?"). Finally, children were asked more specific, yes-no questions about all of the original 28 pre-defined typically-administered dental exam components, as well as 13 yes-no questions about Extra Event components that are very unlikely to occur and would never be completed during a routine dental exam (e.g., "Did you get a shot?"). Table 5 lists the 13 Extra Event components broken

down by the broader events. Of course, because not all children experienced all exam components, some of the typically administered components may have been absent for some children (e.g., some children did not get a fluoride treatment or get an X-ray); typically-administered components that were administered to an individual child will be referred to as Present Components, whereas typically-administered components that were *not* administered to a particular child will be referred to as Absent Components. In addition, children could have reported more than 28 features if they had recalled more than the pre-defined set by reporting additional features during the open-ended questions. The average number of Present Components was 20.96 ($SD = 6.8$; range = 10 - 33) whereas the average number of Absent Components was 11.18 ($SD = 4.88$; range = 3-23). The interviewer was blind to which components were carried out during individual children's examinations, and all children were interviewed by the same person.

Table 4.
List of Extra Event Components asked about during the Memory Interview

<i>Event Categories</i>	<i>Extra event features</i>
Start of Exam	Hygienist looks in child's hair, Hygienist stamps child's hand
Oral Exam	Hygienist cleans child's nose, Hygienist looks in child's ears with a light, Hygienist counts child's fingers
Cleaning/Polish	Child spits in cup
Fluoride treatment	Hygienist gives child shot
X-ray	Hygienist takes x-ray of child's hand
Additional Oral Exam	Dentist listens to child's heart with a stethoscope
Take home	Child gets a comb, Child gets a candy, Child gets a t-shirt

Language skills. Because children's language skills have been shown to be related to their recall performance and the way they talk with parents about events (e.g., Gordon, Ornstein, Nida, Follmer, Chenshaw, & Albert, 1993; Reese et

al., 1993), measures of expressive and receptive language skills were obtained. Expressive language skills were measured with the Expressive Vocabulary Test (EVT: Williams, 1997). This test is designed to assess expressive vocabulary and word retrieval for individuals aged 2 through over 90 years-old. For children younger than 4 years of age, the test begins with labeling items for younger children and then proceeds to synonym items. For the labeling items, the examiner points to a picture or a part of the body and asks for the child to name the item. On the synonym items, the child is asked to tell the examiner another word for the picture. The examiner presents a picture and stimulus word(s) within a carrier phrase. The examinee responds to each item with a one-word answer. Children ages 4 and up started with the synonym section. All stimulus pictures on the EVT are in full color, carefully balanced for gender and ethnic representation. Administration took approximately 15 minutes. The test is co-normed with the Peabody Picture Vocabulary Test-III. Concerning validity and reliability, the development of the EVT follows good psychometric practices and is highly reliable (Bessai, 2001). The test provides scores on two constructs (vocabulary and word retrieval) to form an overall standardized score on expressive language ability. The test has a high degree of internal consistency. Split-half reliabilities have a median of .91, and Chronbach's alphas have a median of .95.

Scoring procedures from the EVT manual were followed. The scoring of the EVT yields age-based standardized scores ($M = 100$, $SD = 15$) in addition to age equivalency scores. Children's calculated standardized scores were used as the final measure of expressive language in this study. For children in the study, the average EVT standardized score was 108.43 ($SD = 11.52$).

The Peabody Picture Vocabulary Test-III (PPVT-III: Dunn & Dunn, 1997) was administered to measure receptive language skills. The PPVT-III is a widely used measure of vocabulary standardized for individuals aged 2- through over 90 years-old. For each item, the examiner says a word and asks the participant to point to the picture that shows the word he or she just said. Administration of this assessment took less than 15 minutes. The validity of the PPVT-III has been firmly established (e.g., Wiesner & Beer, 1991). Concerning criterion-related validity, the PPVT-III has an average correlation of .91 with the WISC-III verbal IQ and .81 with the K-BIT Vocabulary (Bessai, 2001). As reviewed by Bessai, the PPVT internal consistency is high (Cronbach's alpha median = .95 and split-half median = .94), indicating excellent reliability.

Like the EVT, the PPVT-III gives age-based standardized scores ($M = 100$, $SD = 15$) in addition to age equivalency scores. Scoring procedures from the manual were followed and standardized scores were used as the final measure in this investigation. For the current sample, the average standardized score on the PPVT was 100.25 ($SD = 16.41$).

Consistent with testing evaluations for the PPVT and EVT, it should not be surprising that children's EVT and PPVT scores were positively correlated ($r = .81$, $p < .0001$). Because expressive and receptive language standardized scores were significantly correlated, an average of two scores was used as an indicator of language ability in the analyses.

Dental Discussions Questionnaire. A short three-item questionnaire was given to parents to find out whether there had been any discussions about the

dentist visit during the 1-week delay between the exam and the follow-up visit (Appendix I). Parents reported that the parent elicited conversations about the dentist visit on an average of 2 occasions (*range* = 1 to 5) over the delay between the dentist visit and the follow up visit. Parents also reported that children brought up and talked about the dentist visit to parents or others (in the parent's presence) approximately 4 times (*range* = 1 – 20) during the interval between the dentist visit and follow up visit. Most children discussed the event 5 times or less. Two children discussed the event 10 times and another child discussed it 20 times, as estimated by their parents.

Ethical considerations of the study

This study was approved by the University of Kansas Human Subject Committee. Although some children may have experienced stress during the dental exam, the procedures for this study did not put the participants at any additional risk. Appropriate measures were followed to keep information collected about each participant confidential. Each participant was assigned an identification number and all information collected about each participant was identified only by this number and not by name. A master list linked participants' identifying information with data from measures and questionnaires, and only the principal investigators had access to this list (the list will be kept on a password protected computer file). All data collected in paper form was stored in a locked file cabinet in a locked laboratory.

Coding

Elicited Reminiscing Task (ERT). The coding of parent and child talk in the Elicited Reminiscing Task followed procedures similar to those used to code conversational style in previous research on parent-child reminiscing (e.g., Haden &

Fivush, 1996) (Appendix J). The coding scheme was based on Fivush's (2004) and Haden's (2004) coding procedures (adapted from Fivush et al. 2003; Haden, 1998; Reese et al., 1993) for elicited reminiscing tasks (Appendix K) in which two coding dimensions are used (On/Off-topic and Style). This was a hierarchical coding scheme in which each utterance was coded according to the two coding dimensions. Mother's and children's utterances were coded separately. An utterance was defined as a subject-verb construction (subject can be implied). First, utterances were coded as to whether they were on-topic or off-topic. On-topic talk was talk about the particular event that had been nominated by the parent for this task. If the utterance was off-topic, it was not coded any further. Next, on-topic utterances were coded for conversational style, which has four mutually exclusive categories: Elaboration, Repetition, Associative Talk, or Neither. Elaborations were utterances that introduce, provide or request new information (e.g., "Did we see a giraffe?" or "*What happened at the zoo?*"). Repetitions provided no new information and restated things previously said in the conversation by either the parent or the child (e.g., "We saw a giraffe," when this was mentioned previously in the conversation). When the parent-child dyad discussed general knowledge of the event in general but not that specific episode, an Associative Talk code was given. All other statements such as confirmations (e.g., yes, that is what we did), reconfirmations, or negations (e.g., no, we didn't), or other utterances that could not be classified as Elaborative or Repetitive (e.g., hmm, what else?, what did you say?, can you speak up?, I can't hear you) were classified as Neither. All on-topic utterances in all four categories were also coded for two additional narrative style dimensions: the number of Emotions (i.e., use of implicit or

explicit emotional terms, such as “you were excited to do that”) and Evaluations (e.g., “I really liked that part”).

Parent-Child Conversations before, during and after exam. Coding of parent-child conversations followed a coding scheme that was adapted from the coding procedures and instructions used on the Elicited Reminiscing Task (Appendix K). This was a hierarchical coding scheme in which each utterance was coded according to the same two coding dimensions, On/off topic and Style, as in the elicited reminiscing task coding, as well as for the additional dimension of Content. Any discussion of the dental exam or going to the dentist office was coded as On-topic talk. If the utterance was not about the dental exam, or “Off-topic,” it was not coded any further. Content coding involved identifying the particular features discussed. For Narrative Style characteristics, as in the elicited task, mother’s and children’s utterances were coded separately, and each on-topic utterance was coded as Elaborative, Repetitive, Associative Talk, or Neither. An Associative Talk code was given when on-topic talk was about general knowledge pertaining to the target episode (e.g., dentists check your teeth to see if they are healthy), and not about the specific event. In addition, all on-topic utterances were also coded for the additional narrative style dimensions of Emotions and Evaluations. Utterances related to the target episode were further coded for the particular component discussed, which was identified by comparing the utterance to the list of possible components included in the dental exam (those listed in Table 3 and Appendix E). If other children or adults participated in the conversation, their utterances were coded as well.

Memory interview. The children's responses to the Memory Interview were coded to measure the completeness and accuracy of their recall. All components of the exam that were actually administered (Present Components) that were reported accurately, either in response to open-ended or yes-no questions, were assigned an Accurate code. Present Components that the children denied having occurred were coded as Omissions, whereas a Don't Know code was assigned when a child failed to respond to a question or answered "I don't know." For each child, each Absent Component and Extra Event Component was also assigned a code indicating the accuracy of his or her response. Correct "no" responses to questions about Absent or Extra Event Components were coded as Correct Rejections, whereas incorrect "yes" responses were coded as False Alarms. If in response to an open-ended question children reported an Absent Component, Extra Event Component or other non-administered procedure that was not included in the predefined list of exam or Extra Event Components, an Intrusion was coded. Finally, as with Present Components, a Don't Know response code was assigned when a child was asked about an Absent or Extra Event Component and either failed to respond or answered, "I don't know." Because there was variation across children in the number of events administered, proportions out of total events were used in recall analyses.

Reliability

Coding for the ERT and naturally-occurring conversations was completed by a master coder and a "reliability" who coded 21% of the transcripts. Average agreement across the narrative style categories was 90% for the naturally-occurring conversations and 92% for the ERT. Similarly, the memory interview codes were

coded by the master coder and a “reliability” coder who scored 29% of transcripts for reliability. The percent agreement between the master coder and reliability coder was 92%.

Chapter 3: Results

Analyses were conducted in two phases. The first phase focused on parent-child conversation characteristics and was designed to examine naturally-occurring parent-child talk before, during, and after a first visit to the dentist and how these conversations were related to parent-child talk during the ERT. Thus, these analyses looked at the consistency of parent talk and child talk across the three naturally-occurring conversations, the relations between the talk during these conversations and talk during the ERT, and the relations between parent and child talk within each conversation. The second phase of the analyses focused on the links between conversation and memory. Specifically, the second set of analyses examined the degree to which children's memories for their visits to the dentist were related to naturally-occurring talk about the exam before, during, and after the visit, as well as to the conversational style measures from the ERT.

Because some of the data were missing for one of the naturally-occurring time points for four of the families, missing data were imputed using a multiple imputation procedure (Schafer & Graham, 2002).¹ More specifically, data were imputed for the child whose tape recorder failed; for the family that did not record the car ride to the dentist; for the child who had missing data because the examination recording was accidentally shut off before the completion of the exam; and, for the child whose tape recorder was accidentally shut off during the car ride after the dental exam.

¹ Note that analyses of the data prior to multiple imputation revealed similar patterns to those including imputed data.

Preliminary Analyses

For the preliminary analyses, data were screened for univariate outliers as well as for other violations of assumptions (e.g., extreme deviations from normality). Correlations were then run to identify possible associations between individual difference, background, stress, talk, and memory recall variables and to identify possible confounding variables that should be controlled for in the remaining analyses. Due to a relatively small sample size, all correlational analyses involved the calculation of Spearman correlations; this nonparametric technique utilizes the rank of each observation rather than the actual value and is recommended for small samples. First, Spearman correlations were run to determine the relationships among the individual difference and background measures. Consistent with previous research that has found associations between maternal education and language development (e.g., Pancsofar & Vernon-Feagans, 2006; Hoff-Ginsberg, 1998), mother's education was significantly correlated with child's Peabody Picture Vocabulary Test (PPVT) standardized score ($r = .38, p < .04$). Not surprisingly, there was a significant positive correlation between parents' and children's number of elicited conversations about the dentist during the memory interview delay ($r = .44, p < .02$). Second, correlations were used to examine possible relations among the individual difference and background measures and the dental experiences (e.g., stress/ anxiety scores, talk during the delay, or if the child had a cleaning or not), and there was one significant correlations to report. Children who had their teeth cleaned were more likely to have been to the dentist before (e.g., visiting with family member), and children who did not have their teeth cleaned were more likely not to have been to the dentist before (φ

= .50, $p = .01$). Third, potential effects of hygienist, dentist office location, interview location (home or lab), parents' education, age, gender, language ability, and ethnicity on measures of parent-child talk and child recall of the exam were examined. No significant effects for hygienist, dentist office location, interview location (home or lab), gender, parent education, and ethnicity were found; thus, these variables were not included in further analyses. However, significant effects of age and language ability for several talk and memory variables were found. Thus, age and language ability were included as covariates in all analyses.

Additional preliminary analyses were also conducted to examine whether children's recall of the dental exam varied as a function of dichotomous variables included in the parent questionnaire and based on the dentist exam (e.g., child saw both dentist and hygienist, child had teeth cleaned, child had dental problems, and child given reward from parent). Independent t -tests revealed no significant differences in the proportion of accurately remembered events as a function of whether the children had a cleaning (i.e., the Cleaning variable), or whether they had been to the dentist in the past (i.e., the Dentist Before variable). Thus, the study controlled for only child age and language ability in subsequent memory recall analyses.

Conversation Analyses

This analysis phase addressed the first three hypotheses and involved an examination of the relations between and within conversation measures taken before, during, and after the dental exam and during the ERT. Conversation measures included measures of the Quantity of Talk and Narrative Style Characteristics. There

were two Quantity of Talk measures: word count, or conversation length, defined as the number of words the participant (parent or child) said about the dentist during the conversation, and number of features, or the number of features or components of the dental exam (see Table 2; e.g., laid back in chair, got teeth brushed) the participant discussed during the conversation. Because the length of the car rides differed across children, one may be concerned with controlling for car ride time in these analyses. However, overall, the participants talked about the dentist exam during only a small portion of the conversations, suggesting that the overall amount talk about the dentist was probably not limited by the length of the car ride. In addition, it is probably the sheer amount of dentist-related discussion, as opposed to the density of dental talk within in a broader conversation, that should affect children's memory performance. Thus, the Quantity of Talk measures were reported as frequencies rather than proportions. The Narrative Style Characteristics included the narrative-style codes discussed in the Method section: Elaborations, Repetitions, Emotions, Evaluations, and Associative Talk. The Narrative Style measures were also reported as frequencies, for similar reasons as the Quantity of Talk measures. Furthermore, although some reminiscing researchers have used proportions to correct language data for talkativeness, most researchers have used frequencies in order to identify the amount of talk. In fact, similar arguments have been made about the coding of narrative style during ERTs (e.g., Harley & Reese, 1999; Reese & Fivush, 1993). Thus, the use of frequencies facilitated comparison between naturally-occurring talk and ERT talk in this study to prior reminiscing studies. Finally, consistent with

previous research, all ERT measures were reported as means averaged across the two events discussed.

The first hypothesis predicted similarities in naturally-occurring talk across the three time points. To address the first hypothesis, “across-person” (i.e., between parent and child) correlations were conducted between parent and child quality and quantity conversations measures at all four time points to examine patterns similar to previous research. To address the second hypothesis, “within-person” consistency in talk across time was investigated by examining associations across the three naturally-occurring conversations (before, during, and after the dental exam) between quality and quantity conversation measures (i.e., Quantity of Talk and Narrative Style) for both parents and children. To examine the third hypothesis identifying relations between naturally-occurring and ERT conversations, within-person (i.e., within parent and within child) associations between the ERT measures and the conversation measures from the three naturally-occurring time points were examined. Thus, the Quantity of Talk measures and Narrative Style Characteristics from the ERT were related to those from the three naturally-occurring time points separately for parents and children. For all correlations in this phase of the analyses, age and language ability were partialled out.

Before Conversation

Before Conversation measures were analyzed to identify the relations among narrative measures within-person and to examine associations between parent and child talk. Although participants were not explicitly told to discuss the dental exam

during the naturally-occurring conversations, the Before Conversations always included some discussion of the dentist.

Prior to the Before Conversation analyses, and in order to gain perspective on how much car-ride talk actually focused on the dentist, for each individual (child, parent, or sibling), total conversational length in the car (in utterances) was compared to the number of on-topic utterances. Table 5 presents the average number of utterances the participants said overall, and the average number of those utterances that were on-topic. As indicated in Table 5, verbal siblings were present in the car for approximately 25% of the sample. Five children had only one verbal sibling in the car, and one child had two verbal siblings. As indicated in the table, it is apparent that on-topic talk covered approximately one-third of the total conversation. Target children (i.e., the participants in this study) contributed similar amounts of on-topic and total talk as compared to most of their siblings. Not surprisingly, parents contributed most to the conversations.

Table 5.
M (and *SD*) for Before Conversation Utterances, Quantity of Talk and Narrative Style Characteristics

	Parent (<i>n</i> =28)	Child (<i>n</i> =28)	Sibling(s) (<i>n</i> =6)
# on-topic utterances	27 (19)	13 (9)	15 (9)
# utterances	73 (43)	52 (37)	43 (22)
Quantity of Talk			
# of words about dentist ^a	96 (108)	27 (42)	33 (29)
# of dental features	6 (6)	3 (4)	3 (2)
Narrative Style			
# of Elaborations	10 (8)	4 (3)	6 (2)
# of Repetitions	4 (4)	2 (3)	3 (3)
# of Emotions	1 (2)	< 1 (< 1)	1 (1)
# of Evaluations	1 (1)	< 1 (< 1)	1 (1)
# of Associations ^b	5 (6)	2 (3)	5 (4)

^a Conversation Length. ^b Associative Talk.

Table 5 also presents the means for the Quantity of Talk measures and the Narrative Style Measures for parents, children, and siblings. On average, parents contributed four times as many words to the on-topic (i.e., dentist-related) talk as the target child. Siblings' combined average was higher than the child's average, but this is not surprising because most of the siblings were older than the target child. Because less than 25% of the sample had siblings in the car, siblings' conversation measures were not analyzed any further. For number of Features, both parents and children discussed relatively few features on the way to the dental exam. Summing across all individuals in the car, an average of 4.36 features were discussed ($SD = 3.64$). Additional calculations were conducted to examine the number of features that were jointly discussed between the parent and child. Parents and children jointly discussed an average of 3.21 features ($SD = 3.46$). As shown by the Narrative Style means in Table 5, parents were more elaborative than children, which might be expected based on research examining parent-child talk. Most of the parents' on-topic utterances were Elaborations and Associative Talk. The participants expressed few emotions or evaluations during their conversations about the child's first visit to the dentist.

To identify similarities between the parent and child in the Before conversation measures and to identify within-person patterns across Narrative Style and Quantity of Talk, Spearman correlations were run among the parent and child Narrative Style and Quantity of Talk variables, and these are shown in Table 6 (between person correlations are shown in dark gray). Age and language ability were partialled out. As illustrated in the dark gray portions of the table, not surprisingly the

Quantity of Talk variables were significantly intercorrelated for both the parent and child, such that the more features that were discussed the more words that were used in the conversation. When examining within-parent and within-child associations between Quantity of Talk and Narrative Style Characteristics, parents who used more elaborations were more talkative overall as measured by the number of words.

Table 6.
Pairwise correlations between parent and child Before Conversation Measures

	1	2	3	4	5	6	7	8	9	10	11	12	13
Parent													
1. # Words	--												
2. # Features	.79** *	--											
3. # Elabs.	.57**	.39*	--										
4. # Reps.	.52	.33†	.69***	--									
5. # Emots.	-.04	-.05	.11	.41*	--								
6. # Evals.	.26	.35	.47*	.44*	.37†	--							
7. # Assoc.	.43*	.25	.42*	.57* *	.34†	.58**	--						
Child													
8. # Words	.71** *	.58**	.16	.25	-.00	.20	.42*	--					
9. # Features	.65** *	.78***	.12	.08	-.11	.09	.20	.75***	--				
10. # Elabs.	.33†	.21	.42†	.38†	.11	.13	.30	.41*	.27	--			
11. # Reps.	.37†	.17	.31	.56*	.34†	.21	.33	.17	.08	.39*	--		
12. # Emots.	-.02	.05	-.13	.31	.39*	.31	.25	.07	.12	-.25	.35†	--	
13. # Evals.	-.13	.03	.10	.18	.23	.29	.08	-.04	-.08	-.07	-.04	.32	--
14. # Assoc.	.25	.12	.26	.15	.03	.48*	.80** **	.29	.12	.16	.06	-.05	.03

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

As shown in Table 6, within-person correlations between narrative style characteristics indicate that the parent measures were moderately interrelated; elaborations and repetitions were highly positively correlated, and both were positively associated with a number of other style measures. In contrast, the child narrative measures were less intercorrelated; in fact, the only significant association was a positive relation between elaborations and repetitions. Finally, when examining the associations between parent and child conversation measures (shown in the dark gray portions of the table), children's narrative style characteristics resembled those of their parents, which is in line with previous research examining parent-child reminiscing. As shown in the bolded pattern, the majority of conversations measures between the parent and child were correlated.

During Conversation

The number of participants included in the analyses of the During Conversation varied depending on the particular talker (i.e., child, parent, hygienist or dentist) being examined. Seven of the children's parents were not present in the room during the dental exam; therefore, data on parent talk was available for only 21 dyads. Four of the children were not examined by a dentist at all, and five were not seen by a hygienist. Three children had a sibling, in addition to a parent, accompany them into the examination room.

Table 7 presents the average number of utterances overall and the average number of utterances that were on-topic. Nearly all talk during the dental exam, by the dentist, hygienist, parent, and child, was on-topic (89% of the utterances). Table 7 also presents the average Quantity of Talk measures and Narrative Style Characteristics

for the parent, child, dentist, and hygienist. Similar to the Before Conversation, in the During Conversation parents said approximately twice as many words as children. Nevertheless, both parents and children said substantially less during the exam than the hygienists, who by far contributed the most to talk about the exam. The fact the hygienists were more talkative than the dentists may be explained by the fact that they generally spend more time with the child and administer more procedures than the dentist. Thus, it is also not surprising that hygienists discussed far more features than the dentist, the parents, and the children. Parents and children jointly discussed an average of 2.67 features ($SD = 3.81$). When examining across all individuals (with the exception of siblings if present) in the exam room, 17.07 different features ($SD = 7.22$) were discussed on average.

Table 7.
M (and *SD*) for During Conversation Quantity of Talk measures and Narrative Style Characteristics

	Parent (<i>n</i> =21)	Child (<i>n</i> =28)	Dentist(<i>n</i> =24)	Hygienist (<i>n</i> =23)
# on-topic utterances	29 (24)	17 (19)	35 (9)	165 (95)
# of utterances	30 (24)	17 (20)	42 (22)	186 (108)
Quantity of Talk				
# of words ^a	77 (81)	39 (49)	84 (62)	480 (292)
# of features	5 (5)	6 (8)	5 (3)	14 (10)
Narrative Style Characteristics				
# of Elaborations	11.00 (9.07)	5 (6)	11 (10)	41 (34)
# of Repetitions	8.57 (10.17)	3 (6)	11 (8)	50 (49)
# of Emotions	0.16 (0.69)	1 (2)	<1 (<1)	1 (3)
# of Evaluations	1.10 (1.34)	<1 (1)	3 (3)	9 (8)
# of Associations ^b	6.81 (6.71)	5 (9)	5 (5)	14 (14)

^aConversation Length. ^bAssociative Talk.

As indicated in Table 7, although the amount of talk varied among individuals, for all individuals the majority of utterances were Elaborations, Repetitions, and Associative Talk. Most of the parents' utterances were Elaborations,

or efforts to provide new information during the conversation. Although children said very little, most of their comments were Associative Talk followed by Elaborations.

Because only three siblings were present during the exam, their data are not recorded in Table 7. In addition, the three siblings contributed very little to the During Conversation, uttering an average of 18 words about the dentist exam ($SD = 13.11$) and discussing an average of 2 features ($SD = 1$). The majority of sibling talk was off topic or unclassifiable as siblings total word count was ($M = 65.33$, $SD = 33.21$). Siblings made an average of 3.67 associative talk statements ($SD = 4.73$) and less than 1 Repetition ($SD = 0.58$).

To identify relations within the conversation between the parent and child and within the individual, Spearman correlations were run among the Narrative Style and Quantity of Talk variables for the parent and child. Age and language ability were partialled out. Table 8 presents correlations between parent and child Quantity of Talk and Narrative Style characteristics. When examining within-person correlations among Quantity of Talk measures for parents and children, similar to the Before conversation, a pattern appeared indicating that the more features that were discussed by the parent and child, the more words each said, although these correlations only approached significance. In addition, for both parents and children, the more words that were said, the more Elaborations and Repetitions were used in conversation. When examining associations between parent and child Quantity of Talk measures, when the parent was more talkative and discussed more features, the child was more talkative, as well.

Correlations between the parent and child Narrative Style characteristics were also examined (dark gray section in Table 8). For within-person associations, elaborations and repetitions were positively correlated for both the parent and child. As predicted based on the parent-child reminiscing literature, when examining relations between parent and children, parent style and child style measures for the During Conversation were associated (see bolded pattern in Table 8).

Table 8.
Pairwise correlations between parent and child During Conversation Measures

	1	2	3	4	5	6	7	8	9	10	11	12	13
Parent (<i>n</i> =21)													
1. # Words	--												
2. # Features	.81 ***	--											
3. # Elabs.	.79 ***	.70**	--										
4. # Reps.	.75 ***	.59*	.56 *	--									
5. # Emots.	-.13	-.10	-.33	.34	--								
6. # Evals.	.21	.21	.48 *	.09	-.16	--							
7. # Assoc.	.65 **	.51*	.75 **	.45*	-.28	.48 *	--						
Child													
8. # Words	.47 *	.41*	.26	.34	.13	.24	.30	--					
9. # Features	.05	.26	-.19	-.15	.31	.02	-.04	.76* **	--				
10. # Elabs.	.63 *	.62*	.51 *	.55*	-.32	.48 *	.75** *	.77* **	.50 *	--			
11. # Reps.	.16	.19	.20	.22	.29	.28	.05	.51* *	.59 *	.64 **	--		
12. # Emots.	.16	.17	.12	.48*	.71** *	-.24	.21	.27	.31	.26	.22	--	
13. # Evals.	.16	.04	.24	.15	-.15	.43 *	.00	.04	-.14	.18	.21	.18	--
14. # Assoc.	.54 *	.41	.61 *	.26	-.39†	.28	.71** *	.29	.08	.33	.12	.30	.06

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Correlations were also run to identify associations between children's and dentists'/hygienists' Quantity of Talk and Narrative Style Characteristics as children also interacted with the dentist and the hygienist. Children's Quantity of Talk variables were correlated with hygienists' Quantity of Talk variables ($r_s \geq .77$, $n = 23$, $p_s \leq .001$), but not with the dentists' Quantity of Talk variables. When examining relations with dentist and hygienist Narrative Style Characteristics, children used more associative talk when the dentist included more evaluations ($r = .48$, $n = 20$, $p < .05$). In addition when the dentist was more elaborative the children used more emotional terms ($r = .49$, $n = 20$, $p = .04$).

Table 9.
Pairwise correlations between hygienist and child During Conversation Measures

	C # words	C # features	C # Elab.	C # Rep.	C # Emot.	C # Eval.	C # Assoc. Talk
H variables (n=23)							
# words ^a	.77***	.82***	.49*	.42†	.35	-.37	.16
# features	.81***	.88***	.38†	.39	.34	-.31	.08
# Elab.	.59**	.66*	.40†	.38†	.38†	-.19	-.29
# Rep.	.51*	.53**	.25	.11	.16	-.22	-.27
# Emot.	.37†	.44*	.24	.34	.47*	-.30	.33
# Eval.	.44*	.44*	.26	.16	.03	-.16	-.16
# Assoc. ^b	.48*	.55*	.46*	.59**	.40*	-.32	.23

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

^aConversation Length. ^bAssociative Talk.

Although there were only a few associations between the child and dentist measures, there were several significant associations between child and hygienist narrative style characteristics as shown in Table 9. More specifically, children's Quantity of Talk measures were correlated with all of the hygienists' Narrative Style Characteristics suggesting that the child was talkative no matter what conversation

style the hygienist used. In addition, similar to parent-child talk during the exam, hygienists' and children's number of words said, feature talk, and emotions were significantly and positively related (in bold).

Correlations were also run between each adult individual's Narrative Style Characteristics to identify whether there were similarities in talk across the adults after finding relations between the child and parent/hygienist. There were three significant relations between the parents' and dentists' talk, and one between the parents' and hygienists' talk, suggesting that there is some consistency in how parents, dentists, and hygienists discuss the event with the child. There was one significant positive correlation between parent and hygienist use of Emotions ($r = .73$, $n = 15$, $p < .001$), such that both followed the same patterns of use for emotional terms. This pattern could be attributable to the adults' reactions to the children's behavior and talk during the exam. Three significant relations were also found between the parent and dentist, such that when the dentist used more associative talk, the parent was had a longer conversation, mentioned more features, and was more elaborative, ($r_s \geq .58$, $n = 15$, $p_s \leq .04$). When examining relations between the dentist and hygienist talk, the hygienist and dentist narrative style had inverse correlation patterns for elaborations, repetitions, and evaluations ($r_s \geq -.53$, $n = 20$, $p_s \leq .02$). For example, the more elaborative the hygienist was, the less elaborative the dentist was. In addition, the more elaborative the hygienist was, the less repetitive the dentist was ($r = -.64$, $n = 20$, $p = .004$).

After Conversation

All recorded After Conversations included some discussion of the dentist. Prior to analyzing the After Conversation and in order to gain perspective on how much car-ride talk was about the dentist, the total number of utterances each individual made was compared to the number of on-topic utterances. Table 10 presents the average number of utterances overall and the average number of on-topic utterances. As evident in the table, more than 40% of the total conversation was on-topic discussion about the dentist exam. In contrast to the Before Conversations, target children contributed more to the conversation than their siblings. Not surprisingly, parents contributed the most to the conversations.

Table 10.
M (and *SD*) for After Quantity of Talk measures and Narrative Style Characteristics

	Parent (<i>n</i> =28)	Child (<i>n</i> =28)	Sibling(s) (<i>n</i> =6)
# on-topic utterances	35 (30)	22 (22)	15 (9)
# utterances	75 (50)	58 (45)	31 (18)
Quantity of Talk			
# of words ^a	88 (109)	48 (63)	27 (34)
# of features	6 (5)	5 (6)	2 (3)
Narrative Style Characteristics			
# of Elaborations	14 (12)	8 (8)	7 (6)
# of Repetitions	5 (7)	4 (9)	3 (3)
# of Emotions	1 (1)	<1 (<1)	0 (0)
# of Evaluations	1 (2)	1 (1)	1 (2)
# of Associations ^b	8 (12)	3 (4.)	7 (7)

^aConversation Length. ^bAssociative Talk.

Additionally, Table 10 presents the Quantity of Talk measures and Narrative Style Characteristics for the parents, children, and siblings. Parents said twice as many words on average as their children, although parents and children each discussed approximately the same number of features. On average, the siblings talked

less about the dentist than the target child. Parents and children jointly discussed an average of 4.57 features ($SD = 4.90$). Across all individuals in the car, 5.71 features discussed ($SD = 4.03$). Similar to the Before Conversation, the most common narrative style codes for all individuals were Elaborations, Associative Talk, and Repetitions; with Emotions and Evaluations were both less frequent. Parents used almost three times as many elaborations as repetitions, while children used twice as many elaborations as repetitions.

To identify relations within the conversation between the parent and child and within-parent/within-child, Spearman correlations were run among the parent and child Narrative Style and Quantity of Talk variables and these are shown in Table 11. Age and language ability were partialled out. Conversation length was associated with discussing more features for both parents and children. There were several significant within-person and between-person associations among Quantity of Talk measures narrative style characteristics for both parents and children, indicating a connection between the amount and the style in which parents and children conversed about the event. Not surprisingly, number of words uttered by the parent was correlated with parent and child elaborations and repetitions. Parent and child features discussed were correlated with children's elaborations such that the more features both discussed, the more elaborative the child was. Thus, elaborations were associated with both measures of Quantity whereas repetitions were only related to the number of words said.

Table 11.
Pairwise correlations between parent and child After Conversation Measures

	1	2	3	4	5	6	7	8	9	10	11	12
Parent												
1. # Words	--											
2. # Features	.55*	--										
3. # Elabs.	.79** *	.60** *	--									
4. # Reps.	.58**	.28	.59**	--								
5. # Emots.	.14	-.15	.27	.25	--							
6. # Evals.	.56**	.43*	.62** *	.60 ***	.30	--						
7. # Assoc.	.51	.37	.40*	.68 ***	.13	.53* *	--					
Child												
8. # Words	.65** *	.57*	.77** *	.55 **	.09	.61* *	.55* *	--				
9. # Features	.40*	.86** *	.55**	.25	-.13	.40* *	.35†	.64 ***	--			
10. # Elabs.	.69** *	.57**	.82** *	.59 **	.24	.69* **	.53* *	.77 ***	.53 **	--		
11. # Reps.	.47*	.32	.70** *	.57 **	.24	.52* *	.42*	.62* *	.30	.78* **	--	
12. # Emots.	.16	-.11	.30	.19	.36 †	.25	-.25	.11	-.07	.10	.17	--
13. # Evals.	.79** *	.45*	.35	.29	.43 *	.33	.32	.47*	.23	.56* *	.44 *	.00
14. # Assoc.	.35†	.33†	.27	.70 ***	.10	-.02	.47* *	.52* *	.38 †	.40* *	.33 †	-.23

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

In contrast to the previous conversations, when examining within-parent and within-child associations for narrative style characteristics, the number of intercorrelations were similar for parent and child measures. Parents who used more repetitions also used more elaborations and associative talk. In addition, parents'

elaborations were positively correlated with evaluations and associative talk. The same patterns held for children except that repetitions and associative were not correlated. In line with previous research examining parent-child reminiscing, children's narrative style in the After conversation resembled their parents' narrative style (bolded pattern in dark gray section). For example, parents' and children's elaborations and parents' and children's associative talk were significantly positively correlated. Interestingly, parents' elaborations and repetitions were associated with different children's narrative style characteristics, as shown in Table 11.

Stability of Conversation measures: Before, During, and After Conversations

Additional Spearman correlations were used to examine within-person consistency in the Quantity of Talk measures and Narrative Style Characteristics across the three naturally-occurring conversations. Like the previous sets of analyses, children's age and language ability were partialled out. First, pairwise within-parent correlations among Quantity of Talk and Narrative Style Characteristics were examined for similarities across time. There was consistency in parents' conversation length across time whereas this was not the case for parents' number of features discussed across time. Specifically, parents' conversation length After was correlated with conversation lengths for both Before and During ($r_s \geq .45$, $n = 21$, $p_s \leq .05$).

There also appears to be some support for stability in parent Narrative Style Characteristics across the three conversations, particularly for the Before and After conversations, as shown by the correlations in Table 12. Across-time correlations among the parents' same narrative style characteristics are shown in dark gray as these relations were of the most interest. Parent Elaborations were associated Before

and After such that the more elaborative the parent was Before, the elaborative the parent was After. Also indicated in the table, parents' Evaluations Before and After were related. Parents who were evaluative Before were also evaluative After. Finally, the more emotions the parents used Before, the more emotions they mentioned During. Pairwise correlations were also run among Associative Talk measures across time as well as between Narrative Style Characteristics in Table 12 and Associative Talk across the three time points, but no significant cross-time correlations were found (data was omitted from the table for space considerations).

Table 12.
Pairwise correlations between Parent Narrative Style Characteristics Across Time

	1	2	3	4	5	6	7	8	9	10	11
1. ELAB Before	---										
2. ELAB During	.42†	---									
3. ELAB After	.46*	.32	---								
4. REP Before	.69**	.17	.15	---							
5. REP During	.26	.56**	.21	.28	---						
6. REP After	.17	.01	.59**	.30	.36	---					
7. EM Before	.11	-.09	-.28	.41*	.23	.23	---				
8. EM During	-.17	-.33	-.10	.35	.34	.39†	.56*	---			
9. EM After	.55**	.08	.27	.53*	.21	.26	.37†	.30	---		
10. EVL Before	.46*	.30	.20	.45*	.56*	.29	.37†	.33	.62**	---	
11. EVL During	.08	.48*	.21	-.09	.09	.36	-.13	-.16	-.01	.35	---
12. EVL After	.29	.47*	.62*	.26	.52*	.60**	.36	.30	.46*	.41*	.40†

Note: $n = 21$ for correlations with parent During variables.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

To investigate across-time consistency in the child conversation measures, correlations were examined among the child Quantity of Talk and Narrative Style Characteristics from the three naturally occurring conversations. There were slightly more links for Before and After conversation measures than when links between other time points. When examining within-child associations, the more features children discussed During, the more features discussed After ($r = .47, p = .02$). In addition, children's conversation length During were correlated with words said After ($r = .42, p = .03$). When examining associations across Quantity of Talk and Narrative Style Characteristics, the more talkative the child was Before, the more Elaborative the child was After ($r = .42, p = .03$) and the more Associative Talk the child said During ($r = .49, p < .01$). Similarly, the longer the conversation length for the child During, the more Associative Talk the child uttered After ($r = .43, p < .03$).

Table 13 presents pairwise correlations between Narrative Style Characteristics across all three time points. Across-time correlations among the same narrative style characteristics are shown in dark gray. In contrast to the parent data in which style was intercorrelated across time, there was only one association between child Narrative Style Characteristics across time: child Emotions Before were positively correlated with Emotions during, but this may be due to the fact that emotional terms were very infrequent for most children. Therefore, although there was some consistency in the amount children talked about the dental exam across the three conversation, there was essentially no consistency in the style of their talk across time. Additional pairwise correlations were run for Associative Talk across the three time points, but this did not reveal any significant correlations. Pairwise

correlations were also run between Narrative Style Characteristics in Table 13 and Associative Talk at the three time points. Children’s Elaborations After were correlated with children’s Associative Talk During ($r = .38, p = .05$), but no other significant correlations were identified.

Table 13.
Pairwise correlations between Child Narrative Style Characteristics Across Time

	1	2	3	4	5	6	7	8	9	10	11
1. ELAB Before	---										
2. ELAB During	.22	---									
3. ELAB After	.26	.36	---								
4. REP Before	.39	.16	.14	---							
5. REP During	.02	.75***	.31	.10	---						
6. REP After	.19	.14	.78***	.28	.06	---					
7. EM Before	-.26	.18	.04	.35	.22	.34	---				
8. EM During	-.37	.38*	.16	.15	.47*	.14	.59**	---			
9. EM from	-.05	-.05	.10	.18	-.12	.17	.02	-.04	---		
10. EVAL Before	-.08	.03	-.14	-.04	.01	-.12	.32	.00	-.03	---	
11. EVAL During	.04	.21	.21	-.07	.21	-.14	-.13	-.14	.11	.40	---
12. EVAL After	-.18	.13	.56**	.00	.14	.44*	.11	.14	.00	.00	.22

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$

Elicited Reminiscing Task (ERT)

Parent and child Narrative Style Characteristics during the ERT were examined to evaluate the third hypothesis replicating patterns of associations found in

previous parent-child reminiscing literature. Descriptive data regarding the parents' and children's narrative style during the ERTs are presented followed by an examination of any similarities between the parent and child measures during the ERT. During the ERT, parent-child dyads were asked to reminisce about two recent past events. In most cases they discussed two events ($n = 21$) while the other dyads discussed only one event. Parents chose to talk about such common place events as a friend's birthday party, a trip to the zoo or farm, Fourth of July fireworks, and Easter egg hunting. Other topics that parents chose that were discussed less frequently were experiences such as riding on the bus, a trip to an amusement water park, a baseball game, and a family reunion. The events parents spoke about took place an average of 27 days prior to the home/lab visit ($SD = 26$; $range = 5$ days – 5.9 months). The average conversation length for the ERT was 3 minutes and 31 seconds.

As in the naturally-occurring conversation analyses, Quantity of Talk was measured by the number of words uttered. There is no comparable feature measure, as there was no documentation of what had happened during the event, and the events discussed varied for each dyad. Because some dyads talked about one event and others talked about two, Narrative Style Characteristics were measured using mean frequencies per past event following prior analyses in this study and previous ERT studies (e.g., Harley & Reese, 1999; Reese & Fivush, 1993).

Table 14 presents the means for the Quantity of Talk and Narrative Style Characteristics of the parent and children in the ERT. The majority of talk was on-topic (approximately 83%); 17% of the total utterances were off-topic for both parents and children. Both parents and children made more Elaborations than

Repetitions. Overall, parents and children used few Evaluations and Emotions during their conversations. Finally, similar to the naturally-occurring talk and in line with previous ERT studies, parents contributed more to the conversation than the children.

Table 14.
M frequencies (and *SD*) for parent and child during ERT

	Parent	Child
# on-topic utterances	43 (20.83)	25 (13)
# utterances	51 (28.09)	31 (18)
Quantity of Talk		
# of words ^a	393 (197.67)	167 (105)
Narrative Style Characteristics		
<i>M</i> frequencies of elaborations	15 (8)	13 (9)
<i>M</i> frequencies of repetitions	8 (6)	3 (3)
<i>M</i> frequencies of emotions	<1 (<1)	<1 (1)
<i>M</i> frequencies of evaluations	<1 (<1)	<1 (<1)
<i>M</i> frequencies of associations ^b	2 (2)	2 (2)

^aConversation Length. ^bAssociative Talk.

Table 15 shows the pairwise correlations among the parent and child Quantity and Narrative Style characteristics during the ERT. The white cells show within-parent and within-child associations between these measures, and the gray-shaded cells indicate associations between parent and child. When examining within-parent associations between the different Narrative Style measures, parents' Elaborations and Repetitions were correlated, whereas when examining within-child associations between different Narrative Style measures, there were no significant correlations. Patterns of association between parent and child talk measures follow those from previous studies that have used the ERT. Consistent with previous research, parent and child Elaborations were positively correlated, as were parent and child Evaluations and Associative Talk.

Table 15.
Pairwise correlations between parent and child ERT Conversation Measures

	1	2	3	4	5	6	7	8	9	10	11
Parent											
1. # Words	---										
2. # Elabs.	.08	---									
3. # Reps.	.10	.55*	---								
4. # Emots.	.29	.01	-.35	---							
5. # Evals.	.33	-.28	-.27	.08	---						
6. # Assoc.	.08	.08	-.20	.29	-.16	---					
Child											
7. # Words	.80** *	-.03	-.26	.53**	.39*	.07	---				
8. # Elabs.	-.15	.39*	.50**	-.03	-.05	-.17	- .30	---			
9. # Reps.	.31	-.06	-.03	.24	.14	-.19	.39 *	.29	---		
10. # Emots.	.29	.01	-.36†	1.00^a** *	.08	.16	.39 *	-.01	.13	---	
11. # Evals.	-.01	-.17	-.19	-.02	.99^a ***	.10	.49 **	-.03	.24	.07	---
12. # Assoc.	.27	-.04	-.25	.22	-.06	.88***	.24	-.23	- .20	-.06	.22

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

^a Average number was less than 1 for both parents and children.

Across tasks similarities among parent and child narrative style

One aim of the study was to identify links between talk during the ERT, a traditional elicited assessment, and during naturally-occurring conversations. To address this issue, Spearman correlations were calculated to examine within-person associations between Quantity and Style measures taken during the ERT and those taken from each naturally-occurring time point. Age and language ability were partialled out. Overall, for both parents and children, few significant relations were

found between the naturally-occurring talk measures and the ERT measures. For parents, the ERT Quantity of Talk variable was not correlated with any of the naturally-occurring conversation Quantity of Talk variables, whereas child Quantity of Talk during the ERT was related to child talk during the naturally-occurring conversations. Specifically, the more talkative the child was during the ERT (as measured by word count) the more talkative the child was in the After conversation ($r = .39, p = .05$); similarly, the association between child's ERT conversation length and child's During conversation length approached significance ($r = .35, p = .08$). For parents and children, there were no associations between narrative style characteristics from the ERT and the naturally-occurring conversations that were statistically significant or even approached significance.

Summary of Phase I

In sum, when examining event-related talk, the parents and children generally did not engage in much discussion about the dental exam at any of the three time points, and when examining talk at the feature level, most participants discussed relatively few features of the dental exam. The findings generally supported the first hypothesis—that is that parent and child within-conversation measures were associated, which is highly consistent with narrative style associations between the parent and child observed in previous research using the ERT. The results of the conversational analyses revealed consistency in parent talk across the naturally-occurring conversations, but fewer similarities were seen when examining children's talk. The support was limited for the third hypothesis stating that there would be systematic relations between the ERT and naturally-occurring parent conversation measures.

Although similar patterns of parent-child associations were shown during the naturally-occurring conversations and the ERT, somewhat surprisingly, there were no links between talk during the naturally-occurring conversations and during the ERT. Next, the analyses address the second major goal, which is to examine the connection between talk and memory.

Phase 2: Links between talk and memory

The second phase of the analyses was designed to examine the relation between parent-child talk and children's memories. Two major sets of analyses were used to address the question of how parent-child conversations might shape children's memory for the dental exam. The first set of analyses examined whether conversation measures predicted memory measures using general linear models. Specifically, Spearman correlations were used to determine how parents' and children's Quantity of Talk and Narrative Style Characteristics at each time point were related to children's memory. The second set of analyses were conducted at the feature level, and involved examining the particular features that were discussed in each conversation, and compared memory for features that were 'discussed' and 'not discussed' at each time point using paired *t*-tests.

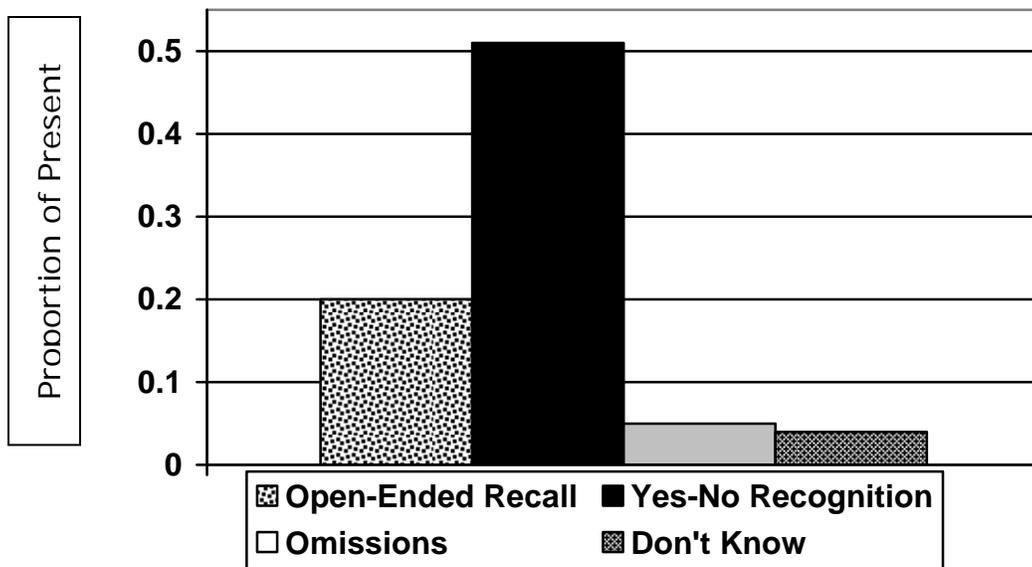
Memory Interview Performance

Analyses of the memory interview were performed to examine how much children remembered about the dental exam after the one-week delay. The number of Present Features varied across children. Thus, for each child, the proportions of Present Features that received an Accurate code, Omission code, and Don't Know/No Response code were calculated. Proportions were calculated by dividing the number

of features classified in each response type by the total number of features that occurred. Accurate responses were further divided by question type (i.e., open-ended or yes-no).

Figure 1 shows recall scores for Present Features. As indicated in the figure, the majority of accurate reporting was in response to yes-no questions, such that 51% of the events that children remembered occurred when they were responding to yes-no questions. Children rarely responded “I don’t know” or said “no” when asked about something that had happened. Overall, children accurately remembered approximately 86% of the Present Features during the memory interview.

Figure 1.
Memory Performance for Present Features, by Response Type.



The analyses of children’s memories of Present Features provide information about how many of the event components were accurately remembered, but provide no information about how detailed their reports of these components were. Thus, the

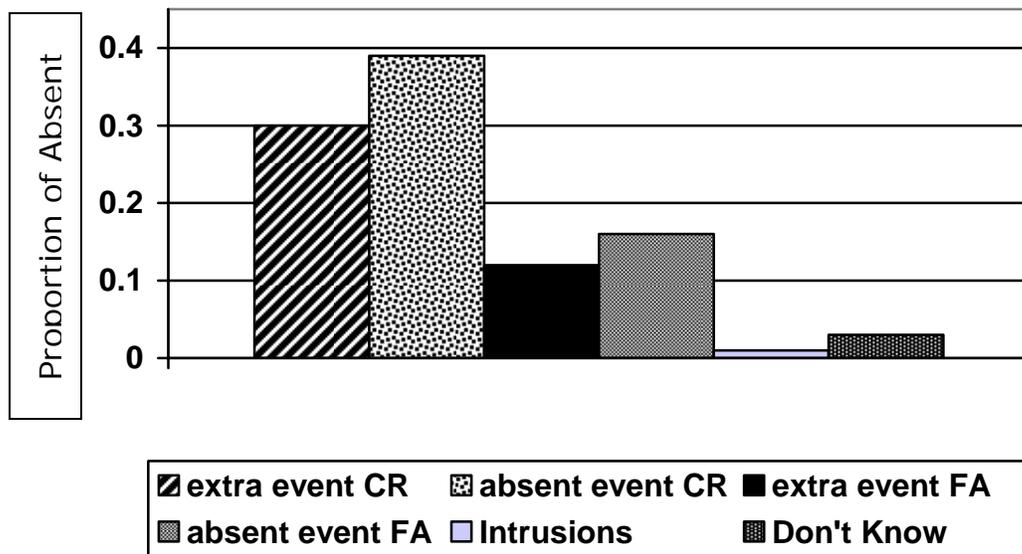
memory interview word counts were examined to help identify how elaborative or detailed the children were in explaining the features of the exam during the memory interview. Simple confirmations and rejections to yes/no questions, intrusions, and off-topic comments (i.e., child getting off task) were not included in the calculation as information from these responses provide no relevant details. All features that were recalled spontaneously or in response to an open-ended probe or were elaborated on after a yes-no question were included in children's word count scores. Because the number of features included in these analyses varied from child to child, these counts were averaged across the features for which children provided *any* details, to indicate the number of words the children said, on average, about each feature. Children used an average of 27.9 words per feature during the memory interview ($SD = 11.91$). Upon examining associations between children's conversation measures at all four time points and children's words said per features, only children's word count during the ERT was significantly correlated ($r = .43, p = .04$).

Children's performance with regard to Extra-event and Absent features is shown in Figure 2. Because the number of Absent features varied across children-as not all children experienced every feature-the proportions of each response type (i.e., Correct Rejection, False Alarm, Intrusion, or Don't Know/No Response), as opposed to frequencies, were calculated. Proportions were calculated for the Extra-event features so as to create comparable scores for both types of Non-Administered features. These proportions were calculated by dividing the total number of features classified into each response category by the total number of Extra-event or Absent features. The majority of responses regarding both Extra-event and Absent features

were elicited by yes-no questions and were coded as Correct Rejections. ‘Don’t know’ responses and Intrusions were infrequent. Seven children made one intrusion during the memory interview, and one child made two intrusions. In the category of intrusions, six children reported events that were included in the predefined set of Absent features. One of the children reported a medical procedure that was not included in the predefined set of Extra-event or Absent features. More specifically, one child reported that his stomach was looked at. Because there were no differences in performance between the Extra-event and Absent features, further analyses collapsed across these two categories to create an overall set of Non-Administered features.

Figure 2.

Performance on Extra-event and Absent features (i.e., Non-Administered features), by Response Type.



The Relation between Memory Interview Performance and Conversation measures

Although the overall memory scores included responses to Open-Ended questions, recall in response to Open-Ended questions was also examined separately because it seemed possible that conversations about an event may influence children's responses to open-ended questions to a greater extent than their responses to recognition questions. Specifically, conversations might make discussed information more salient, creating a stronger or more accessible memory trace, so that children are better able to retrieve that information on their own (Baker-Ward et al., 1993).

Spearman correlations were run to examine the associations between each of the three memory measures and the measures of the quantity and style of naturally-occurring talk at each time point. For each correlation, age, vocabulary level and the other partner's contributions were controlled for (i.e., partialled out), so as to provide information about the contribution of particular parent or child talk measures over and above the contributions of the conversational partner and the child's age and language ability (as estimated by vocabulary score). For example, to determine whether the number of features children discussed before the exam contributed to their memory performance, correlations were conducted between the child Before Features variable and each memory measure, partialing out the parent's Before feature variable in addition to age and vocabulary. Comparable analyses were run to examine the contribution of parent talk, controlling for child talk (and age and vocabulary). This nonparametric approach was more appropriate for this sample than a regression or general linear model approach that would permit an evaluation of the simultaneous

contribution of several variables, because traditional regressions on small samples can result in unstable estimates (Dorans and Drasgow, 1978). For the talk During measures, because all conversations included the child, Spearman correlations were run between the dentist and child, hygienist and child, and parent and child. All correlations presented were for conversation measures that had at least one significant correlation with the memory measures.

Table 16.
Pairwise correlations between Before conversation measures and children's memory measures.

	Memory Measures			
	% AC ^a	% OE ^b AC	% OE Details	% CR ^c
Before conversation measures				
Parent Conversation Length	.13	-.02	.62***	.26
Child Conversation Length	-.16	.17	-.68***	-.06
Parent Elaborations	.17	.14	.39*	.26
Parent Evaluations	.39*	.31	.10	-.37
Parent Associative Talk	.22	.41*	-.21	-.15

* $p < .05$. ** $p < .01$. *** $p < .001$.

^aAccurate Complete. ^bOpen-Ended. ^cCorrect Rejections

Table 16 presents significant correlations between Before talk measures and memory measures. The Before talk measures were primarily related to the Open-Ended memory measures. More extensive (as indicated by conversation length) and more elaborative parent talk about the dentist was associated with more detailed open-ended recall by the child. Parent Associative Talk was also positively related to the number of features reported by children during the Open-Ended portion of the memory interview, and parent Evaluations were associated with better overall memory performance (although probability values were weaker than those correlated with Open-Ended Details). In contrast, only one child Before variable was related to

memory performance: surprisingly, children’s conversation length Before was actually associated with less detailed open-ended recall.

Table 17.
Pairwise correlations between During conversation measures and children’s memory measures.

	Memory Measures			
	% AC	% OE AC	% OE Details	% CR
Parent-Child conversations measures				
Child Repetitions	.29	.14	-.47†	-.11
Child Associative Talk	.61**	-.04	-.27	.02
Hygienist-Child conversations measures				
Hygienist Associative Talk	-.20	-.06	-.49*	-.21
Dentist-Child conversations measures				
Dentist Feature Talk	-.50*	-.29	-.07	.24
Dentist Evaluations	-.11	-.08	-.50*	.07
Child Evaluations	.05	.01	.43*	-.26

^a n = 21. ^b n = 23. ^c n = 25.

† $p < .06$. * $p < .05$. ** $p < .01$. *** $p < .001$.

For During conversation measures, as mentioned previously, the analyses were run examining parent and child, hygienist and child, and dentist and child correlations. Table 17 presents significant correlations between During conversation measures and memory measures. Interestingly, parent talk was not associated with children’s memory for the dental exam, but children’s talk was. The more associative talk the child used, the more features the child accurately remembered. When examining hygienist-child conversations, hygienist talk was associated with children’s memory measures. More Associative Talk by the hygienist was associated with recall of less detail. This finding is surprising because general knowledge about the dentist should help children make connections between knowledge and experience and therefore remember more. However it may be necessary for the child to make the connection, and the hygienists’ associative talk may have been too vague. Similar to

hygienist talk, the dentist conversation measures were also negatively associated with children's memory reports. The more features the dentist discussed, the lower the child's overall memory score. Interestingly, the more evaluations the dentist used, the fewer details the child reported, while the opposite was true for child Evaluations. Children who were more evaluative reported more details about their exams.

Table 18 presents correlations between After conversation measures and memory measures. Both parents' and children's talk measures were associated with children's memory reports, but parent's talk predicted Open-Ended recall whereas children's talk predicted their overall accuracy. When parents discussed the dental exam more extensively (as indicated by the number of words), children recalled more features in response to Open-Ended probes. Measures of children's narrative style were associated with better overall memory performance, such that the more elaborative and repetitive the child was, the higher the child's overall memory score. This finding indicates that both mentioning new details (i.e., elaborations) as well as reiterating previously stated information (i.e., repetitions) were linked to children's memory.

Table 18.
Pairwise correlations between After conversation measures at each time point and children's memory measures.

	Memory Measures			
	% AC ^a	% OE ^b AC	% OE Details	% CR ^c
After conversation measures				
Parent Conversation Length	.10	.44*	-.04	-.37
Child Elaborations	.40*	.20	.04	-.24
Child Repetitions	.50**	.15	-.02	-.25

* $p < .05$. ** $p < .01$. *** $p < .001$.

^aAccurate Complete. ^bOpen-Ended. ^cCorrect Rejections

To investigate previous research claims that children learn autobiographical remembering skills during reminiscing, Spearman correlations were run to examine the associations between ERT talk measures and memory measures. Age, language ability, and the other partner's contributions were partialled out. As mentioned previously, ERT variables were created by averaging across the two ERT conversations (for $n = 21$).

Table 19.
Pairwise correlations between ERT conversation measures and children's memory measures.

	Memory Measures			
	% AC ^a	% OE ^b AC	% OE Details	% CR ^c
ERT conversation measures				
Parent Conversation Length	-.58**	-.01	-.43*	.27
Parent Associative Talk	.00	-.28	-.41*	-.03
Child Conversation Length	.09	-.25	.51**	-.12
Child Repetitions	-.06	-.50**	.22	-.03

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

^aAccurate Complete. ^bOpen-Ended. ^cCorrect Rejections

Table 19 presents significant correlations between ERT conversation measures and memory measures. Similar to the relations between naturally-occurring talk and memory measures, most of the significant relations were between the ERT conversation measures and children's open-ended recall for the dental exam. Interestingly, parent quantity of talk and style was negatively related to the child memory measures. The more verbose the parent was, and the more associative talk the parent used, the fewer feature details the child reported. Relations between children's conversation length and Open-Ended details had an opposite, and more expected, pattern; the more verbose the child was during the ERT, the more feature details the child reported. Interestingly, children's repetitions were negatively

associated with memory performance during the Open-Ended portion of the interview, such that the more repetitive the child was during the ERT, the fewer features he or she recalled during the Open-Ended questioning of the memory interview. This finding is actually consistent with previous research findings on the links between reminiscing and memory, which have suggested that repetitions during ERT are not as beneficial to children's memory skills as the use of elaborations.

Memory for Discussed versus Non-Discussed Features

These analyses examined the effect of conversation on children's recall at the feature level, and involved comparing memory for 'discussed' and 'not discussed' features. First, the content of the naturally-occurring conversations at each time point was examined to identify the individual features that were discussed and not discussed by each parent-child dyad. The total number of Present Features that were Discussed versus Not Discussed were calculated separately for each time point (i.e., Before, During, or After) and these data are presented in Table 20. For the Before and After conversations, if either the parent or child discussed a particular feature, it was included in the Discussed category. For the During conversations, Discussed features could have been mentioned by the parent, the child, the dentist or the hygienist. Similarly, the numbers of Non-Administered features that were Discussed versus Not Discussed were calculated for each time point. Finally, the numbers of Present and Non-Administered features that were discussed at *any* of the three time points were calculated (i.e., the Any Time row) and comparable counts of the numbers of Present and Non-Administered features that were never discussed at any time point were calculated. These data are also shown in Table 20.

Paired *t*-tests were used to compare the average numbers of Present Features that were Discussed and Not Discussed at each time point and overall, and to compare the average numbers of Non-Administered features that were Discussed and Not Discussed. As shown in Table 20, during the exam, a majority of the features were discussed, whereas a minority of the features were discussed before and after the dental exam. Overall, few Non-Administered Features were discussed at any time point.

Table 20.
M (and *SD*) for number of Present and Non-Administered Features Discussed and Not Discussed at each time point and at any time point

	# Discussed	<i>t</i> -test	# Not Discussed
Present Features			
Before	2.50 (2.62)	<****	21.86 (8.19)
During	16.00 (6.99)	>**	8.36 (3.74)
After	4.54 (3.47)	<****	19.82 (7.82)
Any time	17.43 (7.23)	>****	6.93 (3.24)
Non-Administered Features			
Before	0.36 (0.55)	<****	20.75 (5.24)
During	0.54 (0.74)	<****	20.57 (5.30)
After	0.25 (0.44)	<****	20.86 (5.31)
Any time	1.00 (0.86)	<****	20.11 (5.19)

** $p < .01$. **** $p < .0001$

Table 21 provides more details about the “discussed” features at each time point. Specifically, this table presents the number of child participants who talked about or had someone mention to them each feature at each time point. The first row of the table indicates that the most common topic during the Before Conversation was the dental visit in general (e.g., “Where are we going?”; “We are going to the dentist. What do you think about that?”), although it is important to note that this was not considered an individual feature.

Table 21.

Number of study participants who participated in discussions about Feature at each time point

	<i>Before</i>	<i>During</i>	<i>After</i>
Sat in chair	4	11	1
Wore bib	2	14	1
Smiles	0	8	0
H wore Gloves	0	15	0
Leans back in chair	4	24	6
Sunglasses ^a	0	14	3
Open Mouth	15	26	11
Teeth Counted	4	24	3
Tooth Explorer	2	9	0
Uses Mirror ^a	3	15	0
Uses Light ^a	9	8	1
Count Fingers ^b	0	3	1
Teeth Cleaned	9	21	12
Picks flavor of polish	0	14	3
Tickly brush	2	20	2
Water sprayed	1	19	1
Sucked water	1	20	1
Got Shot ^b	2	2	0
Fluoride treatment	0	12	1
Paint	0	4	1
Mouth Guard	0	4	0
X-ray	1	9	3
X-ray jacket	0	2	0
X-ray machine	0	6	0
D wore gloves	0	0	1
D counts teeth	1	12	0
D tooth explorer	2	4	0
Got prize	4	19	14
Got sticker	1	3	5
Got toothbrush	7	16	18
Got Floss	1	3	1
Got Book	1	4	6
Got toothpaste ^a	0	12	13
Got Candy ^b	1	0	1

^a Not Designated Present Features and not specifically asked about in Memory Interview.

^b Extra Event Discussed but did *not* occur.

As shown in Table 21, the most common feature discussed by the parents and children Before was children having to open their mouth and getting their teeth counted. In the During Conversations, talk varied across more features. Most conversations were about leaning back in the chair, opening their mouths, counting

teeth, cleaning the teeth (e.g., in general, with toothbrush, with air sprayer and water sprayer), and receiving a prize and a toothbrush. For the During conversation items could be discussed between the child and either the parent, dentist, or hygienist. The most frequent topics discussed After between parents and children across study participants were getting teeth polished, the toothbrush and toothpaste the children received, and the prize they got.

To determine whether children's recall was shaped by discussions Before, During, and After the dental exam, memory at the feature level was examined as a function of discussion. For each child, the proportion of Discussed Present Features that were accurately remembered was compared to the proportion of Non-discussed Present features that were accurately remembered. Thus, for each time point, the number of discussed Present Features that was remembered accurately during the memory interview was divided by the total number of Present Features discussed at that particular time point. Similarly, the number of Present Features that were not discussed but were remembered accurately during the memory interview was divided by the total number of Present Features that were not discussed at that particular time point. Similar steps were followed to create proportions of discussed and not discussed Present Features that were accurately recalled at the open-ended level of questioning: dividing the number of discussed (or not discussed) Present features that were recalled in response to open-ended questions by the total number of discussed (or not discussed) Present Features at that time point.

Table 22 shows the proportion of accurately remembered features as a function of whether they were discussed at any time and at each individual time point.

For both discussed and not discussed features across all three time points, children accurately responded to memory interview questions suggesting that they remembered most of the dental exam. *T*-tests revealed that discussion During was associated with worse recall compared to features that were not discussed, whereas *t*-tests indicated that children remembered higher proportions of the features that were discussed After the exam than features that were not discussed After. When comparing accurate memory responses for features discussed and not discussed at anytime point, children remembered significantly more items that were not discussed. However, it should be noted that, as indicated in Table 21, approximately seven features were not discussed at any of the three time points, and it is possible that these items may not be especially salient features of the exam. When examining Open-Ended Accurate Recall a clearer picture is revealed. Children’s proportion of Open-Ended Accurate Recall was higher for features discussed at all time points as compared to not discussed features.

Table 22.
M (and *SD*) for Proportion of Accurate Responses and Open-Ended Recall for Present Features, as a function of discussion

	Discussed Features	<i>t</i> -test	Not Discussed Features
Accurate Responses			
Before	0.85 (0.14)		0.80 (0.13)
During	0.76 (0.14)	<***	0.88 (0.13)
After	0.90 (0.15)	>***	0.80 (0.13)
Any time	0.78 (0.13)	<***	0.88 (0.15)
Open-Ended Recall			
Before	0.35 (0.40)	>*	0.19 (0.11)
During	0.26 (0.15)	>****	0.10 (0.10)
After	0.41 (0.33)	>***	0.16 (0.10)
Any time	0.16 (0.12)	>***	0.07 (0.11)

* $p < .05$. ** $p < .01$. **** $p < .0001$

Finally, to determine whether discussion of features that *did not occur* (i.e., Non-Administered Features) was associated with more memory errors on those features, the effect of discussion on memory responses regarding Non-Administered Features was examined using paired *t*-tests. Discussions of Non-Administered Features may have distorted children's accounts of what happened during the exam. Thus, it may be that children may have a lower likelihood of Correct Rejections on Non-Administered Features that were discussed at some time point than for features that were not discussed. To address this issue, for each child, proportions of features that were Discussed and coded as Correct Rejections were compared to the proportion of features that were Not Discussed and coded as Correct Rejections. Proportions of Correct Rejections that were discussed were calculated by dividing the number of Discussed Non-Administered Features that were Correct Rejections by the total number of Non-Administered Features that were discussed (using information from Table 21). The same steps were followed to create proportions of Correct Rejections that were Not Discussed, by dividing the number of non-discussed features that were Correct Rejections by the total number of Non-Administered Features that were not discussed. The results indicated that the proportion of features that were coded as Correct Rejections that were Not Discussed at each time points were higher than the proportion of features that were coded as Correct Rejections that were Discussed, $t(1,27) \leq -2.16, ps < .04$. Thus, these findings suggest that discussions of non-administered features negatively affected children's recall.

Summary of Phase II

In sum, children recalled most of the features from the dental exam, although the majority of the features that were remembered were reported in response to yes-no questions, as opposed to open-ended questions. There were limited findings demonstrating relations between conversation measures and children's memory measures. Findings suggest that for Before conversation measures, parents' quantity of talk and style was positively associated with children's open-ended responses, while children's conversation length and Elaborations were negatively associated with related to the amount of detail they reported. For During conversation measures, children's Evaluations and Associative Talk were positively associated with memory responses while their repetitions were negatively correlated with memory measures. Although parents' During contributions were not related to children's memory performance, some of the hygienist and dentist style measures were related to performing poorly on the memory interview. For After conversations, parents' conversation length and children's style were associated with more accurate memory responses. The examination of memory at the feature level also revealed some evidence that discussions about the dental exam were related to children's memories for the event, particularly their Open-Ended Recall. The comparisons of memory for Discussed and Not Discussed features illustrated that discussions occurring at any time point were associated with better open-ended recall performance. The fact that children also responded *less* accurately to yes-no questions for Non-Administered features that were Discussed compared to Non-Administered-Not Discussed features provides additional evidence for the effects of conversation. The findings related to

overall recall of Discussed and Not Discussed events, however, were less clear. Finally, there were few links between ERT conversation measures and child memory. Most significant correlations indicated negative relations between ERT conversation measures and children's memory measures with the exception of one positive correlation for children's conversation length and open-ended memory details.

Chapter 4: Discussion

The current study connects two literatures, one that examines parent-child reminiscing about past shared events and the other that focuses on the completeness and accuracy of children's recall of events that have been documented. There were two overarching goals to the study. First, the study explored similarities in Quantity of Talk and Narrative Style within and across parent-child conversations that took place before, during and after the child's first dental exam and during an elicited reminiscing task (ERT). For the second goal, the study explored how parent and child discussion of the event shaped children's memories of the event. The discussion includes interpretations of the findings at each time point, as well as design limitations, future directions, and interpretive theoretical applications.

Relations of parent and child narrative characteristics within and across conversations

Current study findings supported the first hypothesis that parent and child conversation measures were interrelated within each conversation. Parent and child conversation measures were related at each time point indicating similarities across contexts in how parent and children discussed events, in both quantity and style. As predicted based on research using the ERT (e.g., Reese, Haden, & Fivush, 1993; Fivush, Haden, & Reese, 1996), when examining the relations between parent and child measures within conversations, corresponding parent and child measures of the same talk dimension (e.g., parent elaborations and child elaborations) were positively associated, extending the finding to naturally-occurring conversations, and to a more diverse sample. Of most interest was to examine parent and child elaborations, as

elaborations are indicators of new details being mentioned. Parent-child elaborations were positively correlated at each time point, such that when parents were elaborative so were their children. As research has shown that children's advancements in language skills and age are positively associated with characteristics of parent-child conversations about the past (e.g., Fivush et al., 1995; Haden et al., 1997), it is important to note that the parent-child associations observed in the current study were not simply a result of the children's age or language ability; both variables were controlled for in all analyses.

As has been observed in the parent-child reminiscing literature, the current findings indicated that parents lead conversations about events with their young children by talking more and providing more detailed information about the event than their children, during the elicited reminiscing task as well as the naturally-occurring conversations (Nelson & Fivush, 2004; e.g., Haden et al., 2001). When examining the conversation length, parents were contributing the most to the conversation, but the number of features discussed were similar, at all time points, for parents and children, indicating that parents were being more talkative about each feature. Further, parents had more on-topic utterances than their children across all recorded conversations. Parents were not being more talkative necessarily as a result of the child being younger or having less language ability as both language ability and age were controlled for in all analyses. These finding suggests that the parent is guiding the child how to communicate in each context.

Further, even when examining conversation during the event, when other adults participated in the conversation, findings suggest that it is the parent, rather

than all adults, who the child is mirroring. Although relations were seen between the child and the primary contributor to the conversation, the hygienist, the majority of associations were between the hygienist's conversation measures and the children's quantity of talk measures. In other words, the child was simply contributing more to the conversation and discussing more features with the hygienist and not duplicating her style. The child did not follow every adult as there were few associations between the child and dentist. Perhaps this is because, in most cases, the dentist was not the primary contributor to the conversation. Any significant correlations that were found between the dentist and child should be taken lightly as the number of significant correlations were below that of chance, whereas the associations between the child and hygienist, and parent and child, exceeded those expected by chance.

In addition to parents contributing more detailed information and on-topic talk than children, parents also were more consistent in their conversational style across time than children, as evident examining within-person correlations across time points. Parents also showed more stability in their style across conversations and contexts than children, particularly relations between the car ride conversations.

Children's lack of stability across time is perhaps because of differences in the children's relevant knowledge. The number of within-child correlations increased as the event progressed suggesting that children's lack of consistency is not due to changes in context (car ride or during the exam), but perhaps changes in knowledge. Children in the current study had no prior experience with dentist exam, and given the novel situation, discussions before and during the event may have presented cognitive challenges for children to select relevant information to discuss (e.g. Guttentag,

1997). In contrast, after the event it may have been easier to discuss and more salient given that children had personal experience. Thus, the more the child knew and experienced about the event, the more similarities among children's style measures within the conversation.

One limitation of running a large number of correlations is the increase in type I error rate associated with multiple analyses. In discussing the stability in parent and child style across conversations, it should be noted that even though as many as 137 correlations were run when comparing each person's conversation variables across time, the number of significant across time correlations for naturally-occurring conversations for parents was above the number expected by chance (for $\alpha = .05$), whereas this was not the case for children. Therefore, findings regarding children's stability should be interpreted with caution.

As discussed, the study extended some of the reminiscing literature findings to naturally-occurring talk. Specifically, there was support for the first hypothesis that there were relations between parent and child talk, and partial support for the second hypothesis that there would be within-parent correlations across naturally-occurring conversations. Yet, associations between naturally-occurring and ERT conversation measures were limited, and not supportive of the third hypothesis. More specifically, when examining consistency across naturally-occurring and ERT conversation measures, for either parents or children, there was little stability. Further, any significant findings should be interpreted with caution as the number of significant correlations found was very low and less than that expected by chance.

Instability between naturally-occurring and ERT conversation style measures may be explained due to event differences (the ERT was not the same event as the naturally occurring talk) and context differences. In support of these explanations, previous research has found that parents who are highly elaborative during reminiscing are not more conversational when discussing (unrelated) events during free play or storybook reading (Haden & Fivush, 1996; Liable, 2004). Another explanation is that it has to do with differences in the timing of the discussion and the context. In the current study, the Before and After conversations took place immediately before and after the event whereas ERT conversations tend to be about events that had occurred in the more distant past. The Before and After conversations were also in the car rather than a more structured environment that is created for ERTs. Another difference between the ERT and naturally-occurring conversations was that in the ERT parents and children were directed to discuss an event that is nominated by the parent, whereas in the naturally-occurring conversations, parents and children were not instructed to have any discussion. A final explanation for the lack of associations between the ERT and naturally-occurring conversations is that it is accounted for by how the conversations were examined as the focus of the analysis was on conversations about a specific event and the majority of car ride conversations were not about the dentist exam.

Links between discourse and memory recall

The analyses of children's memories for their visits to the dentist indicated that they remembered most of the features of their dental exams, although the majority of the features were reported when asked yes-no questions as opposed to

open-ended questions. Children reported around 20% of Present Features when asked open-ended questions, and approximately half of the Present Features during yes-no questioning. These patterns are consistent with those of other studies examining young children's recall of medical experiences (e.g., Baker-Ward et al., 1993; Ornstein et al., 1997; Ornstein, Baker-Ward, Gordon, Pelphrey, Tyler, & Gramzow, 2006). One major focus of the study was to examine linkages between discourse and memory accuracy, and more specifically to extend the literature to examine accuracy in recall for naturally-occurring conversations about the event.

The analyses of the relation between parent-child talk and child memory provided some evidence that naturally occurring adult-child conversations about the event are related to the way children later remember that event. For conversations before and after the exam, parents' quantity of talk measures were associated with improved recall before, as well as after. These findings are consistent with the parent-child reminiscing literature. Interestingly, children's conversation measures were linked to their memory measures at each time point, but the patterns of associations were not consistent across time. More specifically, children's quantity of talk Before was negatively associated with recall while children's talk measures After were associated with improved recall. This change over time in the direction of the association between children's talk and memory was perhaps due to changes in the child's knowledge and experience of the event. Unlike parents, hygienist and dentist conversation measures were negatively related to children's memory. A more detailed interpretation of the findings at each time point follows.

For conversations Before, parent's quantity and quality of talk were more strongly associated with children's open-ended recall than were the children's conversation measures. Because children had no experience getting a dental examination and the parent contributed the most to the Before conversation, it is likely that children were following their parents' discussion of the event. Children's talk was negatively associated with their memory for the dental exam which is perhaps partly due to children's lack of knowledge. Children discussing an event that they did not know about may have been interfering. Of course, the low number of significant relations between children's before conversation measures and memory measures suggest that any findings should be interpreted with caution.

In contrast, the number of significant correlations between parent conversation measures and children's memory measures was above that expected by chance, indicating that there was a general pattern of association between parent talk and child memory. The parent was informative and a knowledgeable source. Parents' conversation length was associated with more feature details reported as well as more accurate open-ended recall. Parent elaborations, discussion of features, and use of associations conveyed new information and made connections to previous knowledge the child may have had, possibly leading children to better understand and remember the event.

Previous research indicates that how prior knowledge influences representations of the experience depends on the specific information provided and how it is presented (e.g., Sutherland et al., 2003). Similar to the current study, Sutherland et al. (2003) found that event-specific preparation for a staged event was

beneficial for children's memory of the event. Interestingly, the current study is one of the first studies to document pre-event elaborations being linked to improvements in children's recall (rather than event preparation in general). Previous research suggested that pre-event elaborative discussions did not improve young children's memories for the event compared to empty talk (e.g., McGuigan and Salmon, 2004, 2005). However, these studies may have had less ecological validity compared to the current study as in previous research the events were experimentally induced and were between an experimenter and child. One may speculate that preparation was likely to lead to children having a stronger knowledge base for the specific features which led to stronger memory traces and easier retrieval. These findings follow previous research examining the role of knowledge and memory, following the constructivist framework of memory (e.g., Chi, 1978).

As compared to pre-event talk, fewer linkages between conversation measures and children's memory were apparent for discussions during the dental exam. The associations that were observed are also more difficult to interpret. There were no linkages between parents' talk during and children's memory for the event. With the exception of the positive relation between children's use of associative talk (or utterances about general knowledge) and memory, most associations between talk during and memory were negative. For example, the hygienist was the most talkative and did describe many of the features, yet there were no positive associations between conversation measures and memory. One explanation for this may be that children were unfamiliar with the hygienist and this, combined with the event being new, made it difficult for children to process much of the information that was said. It is

also possible that this correlation may be spurious as the number significant correlations did not exceed what was expected by chance. Dentists' talk was also negatively associated with memory, and the number of correlations exceeded those expected by chance. Yet, the findings are difficult to interpret other than the fact that the child was unfamiliar with the dentist, and the dentist did not converse as much as the hygienist. A final explanation for the negative relations between adult talk and memory may be that these adults were just responding to some characteristic or behavior of the child that is associated with poorer memory (e.g., higher stress, greater confusion, less attentiveness).

There are several explanations for the lack of finding positive relations between conversation during the event and children's memory for the event. The event selected was not focused around conversation between the children and adults as the children needed to have their mouths open for a majority of the time. In addition, the children did not have prior personal experience, or even possibly a script, for the event. The event in the current study restricted children's abilities to participate in the conversation during the event which may have hindered the child's engagement and encoding of the event. Baker-Ward et al. (1997), as well as Haden et al. (2001) suggest that encoding is driven by a cognitive process in which the child is engaged as the event unfolds. Children being unable to verbalize during the exam may have made it difficult to link features which implicated how well information was encoded, understood, and remembered (Haden et al., 2001). Thus during the event it may have been challenging for the child to appropriately process and store the information. Although previous research that has found benefits of parent-child talk

during an event and children's open-ended recall, the events were set up so that the parent and child could actively engage in the activity (e.g., Haden et al., 2001). In addition to differences in the event, in the current study, only a subset of the children had their parent in the room.

Finally, for conversations after the dental exam, children's quality of talk, was positively related to overall accuracy suggesting that because the children now had a first hand experience of the dental exam, they were able to give a more accurate memory report. Not only was the inclusion of new details important for memory, but also reinstating what was said previously in the conversation was beneficial as well. Elaborations and repetitions may have led children to build a stronger memory representation about the event. Interestingly, the lack of associations between parents' quality of talk After and memory may also be attributed to children gaining more knowledge and experience of the event, as after the exam it is only parents' verbosity that was associated with memory. The associations between the parents' talk and children's memory should be interpreted with caution given that for the number of correlations run, an $\alpha = .05$ would be 1.4. Even so, all of these findings suggest that discussions After may have helped in children's understanding and reinstating the novel experience of going to the dentist, which is not surprising given previous research examining talk after and event and memory (e.g., Leichtman et al., 2000). In fact, previous research has shown that discussion after a medical procedure can enhance young children's recall (e.g., Chen, Zeltzer, Craske, & Katz, 1999; Salmon, McGuigan, & Pererira, 2004).

Yet, based on previous research, it was expected that parents' elaborative talk after the event would also be associated with improved recall, but this prediction was not supported (Haden et al., 2001; Boland et al., 2003; Leichtman et al., 2000; McGuigan & Salmon, 2004; Conroy & Salmon, 2006). One difference between the current study and previous studies is that the discussions took place immediately after the event, and not in an elicited or experimental setting which may have led to differences in how the event was discussed. Further there are differences between the events in previous experiments and the current study's event. Leichtman et al. used a naturally-occurring event but the event was not shared with the parent. The studies run by Salmon and colleagues used experimentally induced events that were depicting real life experiences.

In addition to examining correlations between conversations about the event and memory for the event, feature level analysis was performed to compare memory for features of the exam that were discussed versus those that were not discussed during the naturally-occurring conversations. These analyses also examined whether discussions of non-administered features were related to children's memory reports. It is important to note that there was no experimental manipulation or control over which features were discussed and which were not, and features that were discussed may have been more (or less) salient than features not discussed. There were no manipulations in the study as one goal of the study to examine parent-child talk during real-life experiences (to relate naturally-occurring discussions to the ERT). Thus, these findings should be interpreted with caution.

When examining recall patterns at each naturally-occurring time point, it was evident that there were more linkages between conversations and open-ended recall than overall recall. This pattern suggests that discussions may influence the ability to freely recall information. Specifically, conversations may have led children to create stronger or more accessible memory traces, and in turn, more easily retrieve that information. In contrast, discussion may not be as influential on recognition (i.e., responses yes-no questions).

Differences in the open-ended recall of discussed and not discussed features bolster the argument that naturally-occurring talk influenced children's recall. Specifically, features that were discussed were remembered better at the open-ended level than features that were not discussed, regardless of when that discussion occurred (i.e., before, during or after). However, the analysis of overall recall as a function of discussion showed that discussion was related to better memory only if it took place after the exam; in fact, features that were discussed during the exam (as well as at any time point) were actually less likely to be remembered overall than features that were not discussed. It is difficult to explain why no discussion would lead to better overall recall, but it is plausible that the features that were discussed were different from those that were not discussed. For example, all hygienists/dentists wore gloves and this fact was highly visible to the children, but the hygienist discussed their gloves with only half of the children in the sample, and none the dentists ever discussed wearing gloves. Likewise, some of the features may have been too complex for children. For complex events, representations based on little information may be too poorly organized to integrate information. Thus children may

not have integrated features of the event with other features or general knowledge insufficiently storing the information (Sutherland et al., 2003).

The constructivist memory framework would suggest that knowledge can both enhance, as well as distort memory. The current study provides evidence for both cases. In addition to showing better open-ended recall of present features that were discussed, discussion of features that did not occur increased children's memory errors. Correct Rejections at each time point were lower for discussed non-administered features than those not discussed. Thus, according to the constructivist memory framework, it can be argued that through knowledge and experience, children's memories are malleable.

Although few studies have examined the relationship between children's talk and children's later recall, it is not completely surprising that children's contributions led to improved recall as a large body of literature has shown this (e.g., Brown & Craik, 2000; McGuigan & Salmon, 2004). This study adds to a growing literature indicating that children play a critical role in shaping their own memories through active participation and discussion (Haden et al., 2001; McGuigan & Salmon, 2004; Reese, 2002; Tessler & Nelson, 1994). Also, it is not just the children's contribution that influences recall as a large literature, as well as the current study, has indicated that other's participation in discussions also enhances recall (e.g., Haden et al., 1997; Haden et al., 2001; McGuigan & Salmon, 2004; Leichtman et al., 2000; Tessler & Nelson, 1994).

Upon examining the links between the elicited reminiscing conversations (the ERT) and children's memory an interesting pattern was found. Parent's quality and

quantity of talk during the ERT was negatively associated with children's memory while children's talk measures had opposite patterns. Children's conversation length was positively associated with children's details remembered yet their repetitions were negatively associated with children's open-ended recall. The first correlation makes sense given that both were measures of verbosity, although the memory measure was words per feature rather than an overall word count. In comparison to children's repetitions immediately after, children's ERT repetitions were negatively associated with accuracy at the open-ended level. Although repetitions are usually important for memory consolidation and rehearsal for a specific event, repetitions may not lead to improvements in memory skills. This finding is consistent with reminiscing literature which suggests that repetitions during ERT are not as associated with memory ability as the use of elaborations. Negative associations between talk and memory maybe due to methodological constraints of the study. More specifically, associations found between the ERT conversation and children's memory reports for the dental exam may be due to the timing of the discussions. Children were first asked to discuss past shared events with their mother before being given a standard memory interview with the experimenter. Children may have been used to discussing events more freely and the differences in the interviewers' style and parents' reminiscing style may attribute inconsistent findings with previous literature.

The low number of positive associations between talk during the ERT and children's memory performance was surprising in light of the previous research showing positive correlations between ERT measures and children's memory skills..

It is important to note that the within-ERT patterns of correlations between parent and child talk were quite similar to those of previous ERT studies, thus it seems unlikely that the unanticipated findings have to do with procedural or coding differences in the ERT. Moreover, the length of the conversations in this study was quite similar to those observed in previous studies (Reese, personal communication, July 26, 2005). One explanation for the failure to replicate previous patterns may be that they have to do with differences between the memory interview used in this study and the measures of memory used in previous studies. In the current study, children were asked questions during a structured memory interview to report what they remembered and transcripts were coded for accuracy. In previous studies, parents led discussions about what happened, but parents may not have been as concerned with accuracy and the conversations were not systematically structured. Other studies have just focused on how much children remember about non-documented events and have not looked at accuracy as well as detail. Thus, recalling the dentist visit accurately is not necessarily a key factor in reminiscing about the dentist visit, and further, indicating that reminiscing is more about the remembering process.

Yet another explanation may be differences between the memory interview delay and average delay for the events discussed in the ERT. The average delay for the memory interview was 8 days whereas the average delay for the ERT was 23 days. A large literature has shown that children's recall weakens over time (e.g., Ornstein et al., 1997), suggesting that timing may have played a role in the differences in memory findings between naturally-occurring and ERT conversations.

Additional conversation recordings in the home may have provided more linkages between the ERT and children's memory for the exam. The current study only examined discussions immediately proceeding and following the event, and it is evident that there were other opportunities for discussions that had taken place in the home (which may have been more similar to the ERT), but were not recorded. There were also discussions that were not explicitly chosen by families to discuss. It would also be interesting to record more family conversations after an event and before a memory interview to further examine how children construct and make new meaning of past events, possibly for the event to be discussed and an unrelated event. Choosing to record conversations of everyday events, as well as novel events, may further indicate how children come to understand and remember their past. This additional data may provide a better understanding about the differences and similarities between the ERT and naturally-occurring conversations. Additional assessment(s) would have been plausible for the current study given that most parents disclosed that discussions about the dentist occurred between the exam and follow-up visit. However, explicitly asking parents to record conversations about the dentist visit before the memory interview may have influenced parent's post-event discussions, and may have had implications for children's recall. Regardless, more narrative style associations may have been found by examining a dentist exam discussion in the home.

Some of the current study findings between talk and memory provided limited support for Nelson and Fivush's (2004) extension of the social culture developmental theory that the way in which parents discuss and socialize during reminiscing

influences children's memory skills. According to Nelson and Fivush, the impact of highly elaborative discussion is generalized and influences the organization of the entire experience. This would suggest that strong linkages should have been observed between parents' and children's elaborations during the naturally-occurring conversations and memory, yet strong linkages were not found suggesting that elaborative discussion may not generalize to the entire experience, and may depend on the context, timing, and nature of the event. Furthermore, the links between the elicited reminiscing conversations (the ERT) and children's memory were also somewhat limited, and some of them contradicted predictions from Nelson and Fivush's (2004) model. Specifically, parents' talk was negatively associated with children's memory reports; when one would expect positive associations based on the social cultural theory.

In sum, the study explored similarities in Quantity of Talk and Narrative Style within and across parent-child conversations that took place before, during and after the child's first dental exam and during an elicited reminiscing task (ERT). The current study was able to extend previous findings by focusing on naturally-occurring conversations, which to date, no other studies have examined. Parents' style was consistent during naturally-occurring talk, but not between naturally-occurring time points and the ERT. Children's style mirrored their parents', rather than other adults with whom they interacted, although there were links between children's quantity of talk and hygienists' conversation measures. Although the current study was one of the first to examine parent-child reminiscing with families from more diverse income and education levels, findings were similar to previous research involving predominately

middle-class families. More specifically, within conversations, parents' conversational style was similar to children's conversational style at every time point.

For the second goal, the study explored how parent and child discussion of the event shaped children's memories of the event. The current study was the first to examine parent-child discourse in a naturally-occurring rather than experimenter-elicited setting, before, during, and after an event, as it relates to children's recall. In addition, the study was one of few studies to date to record the event of discussion in order to examine how parent-child reminiscing related to children's abilities to accurately remember an event, rather than simply *how much* information they provide about past events. There was evidence that discussion before, during, and after an event play a role in children's memory reports for the event discussed. Following the constructivist framework of memory, differences across time were attributed to changes in children's knowledge and experience of the event. Children also showed less accurate memory reports for discussed features that did not occur during the exam. Following the social-cultural framework of memory, even in everyday settings the way children talk is guided by parents, other adults, and social interactions.

Limitations and future directions

There were several limitations of the current study that may be addressed in future research. There was actually little talk about the dentist during the car ride conversations, and these discussions were not especially rich and complex. One reason for lack of talk before could be that parents did not know exactly what would happen during the dental exam and so preparatory talk was limited due to the uncertainty of the event. It was not always the case that features that were discussed

prior to the exam had occurred during the dental exam as parents were only informing children about what they think was going to happen. Although there was little on-topic talk, off-topic naturally-occurring conversation utterances were not coded and may have provided more information in regards to consistency of style across conversations.

The current study is novel in its focus on parent-child conversations that were naturally occurring. Future research should use a more naturalistic methodology, such as the one used in this study, to examine the context and functions of family narratives as they arise. Rarely have reminiscing studies examined conversations that were not experimentally induced in a laboratory. The documentation of naturally-occurring events is important to capture; however, there are also some limitations to this methodology. For example, discussion of the event was selective and may have been determined by the nature of the event and the goals of the participants. It is possible that the features parents, children, and dental staff chose to discuss were more central and salient, and therefore easier to remember than those not discussed. Contextual clues may have also determined which features were discussed. For example, children often discussed receiving a toothbrush and prize after the exam. These items provided contextual cues, which may have influenced the likelihood of discussion, as well as memory, regardless of discussion (e.g., DeTemple & Beals, 1991). Thus, it may be advantageous for future research to use both experimental and naturalistic methods to in order to better understand the process and context in which autobiographical memory develops.

Although the study findings were from families with more diverse socioeconomic backgrounds compared to most of the reminiscing literature, the findings may be restricted to Western cultures (Wang & Brockmeier, 2000; Leitchman, Wang, & Pillemer, 2003). Further examination of individual difference and background measures may account for diversity in the narrative conversations. Future research should further examine what roles diverse backgrounds play in the way that parents and children converse. In addition, there is an overall need for more exploration of individual differences in the way that parents elicit children's participation in conversations across time (past, present, and future).

Finally, although it was expected that the first visit to the dentist would be stressful, ratings of anxiety were not high. Researchers may wish to examine the link between talk and memory for more stressful events as parent-child discourse may be atypical. By gathering information about children's emotional well-being and family narratives, more insight can be gained as to how children come to understand events as well as who they are (e.g., Fivush et al., 2004; Bohanek, Marsh, Fivush, & Duke, 2006; Sales & Fivush, 2005).

Implications and Conclusion

How parents shape events and how children come to understand and represent their own experiences is an important process to investigate (Fivush, 1994; Bauer, 2006). As evident in the current study, parents are leading conversations by contributing more detailed information and on-topic talk across time points compared to their children. Parents also are more consistent within conversations across time. These findings suggest that children's narrative style is driven by the parents'

narrative style. The current study also indicates that conversations are related to how the child recalls the event.

As suggested by previous research, parent-child reminiscing goes beyond influencing memory and narrative development, as emotional development, critical thinking and socialization skills are also learned. Additionally, reminiscing and parent-child discourse about personal events are related to child outcomes, such as identity formation and social skills (Fivush, Bohanek, Roberston, & Duke, 2004; Fivush & Nelson, 2000; Miller, 1994; Ochs, Taylor, Rudolph, & Smith, 1992). Furthermore, there is a large literature that documents strong associations between content and quality of parent's talk and children's understanding of the mind and other psychological phenomena (Harris, 2007; Thompson, 2007). Although children's discussion of and memory for the first visit to the dentist may not be critical for children's developing their identity or defining personal relationships, the form and function of how the event is discussed may influence how the child retells and constructs this and other autobiographical memories.

The study findings have implications for children's event memory and suggestibility, such that discussions, whether the event happened or not, were related to children's memory reports. The results of this study are also relevant to some important real-world issues. For example, by better understanding the factors that influence the way children come to understand and remember novel events, parents, teachers and other adults can more effectively prepare and talk to children about these events. In addition, research examining the role of preparation of events indicates that when adults provide a verbal plan of the event children better understand the

relevance of planning for a goal-directed activity, and are better able to carry out the plan (e.g., Hudson et al., 1997). Thus, it may be beneficial for parents to give the child prior knowledge about the event, remind the child of the goal, and inform the child more about what will happen during the event. Because it is difficult for young children to plan events, scaffolding and reminders would also be important for parents to use, even if these techniques may not affect recall (e.g., Hudson, 2002).

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**Appendix A
Recruitment Flyer**

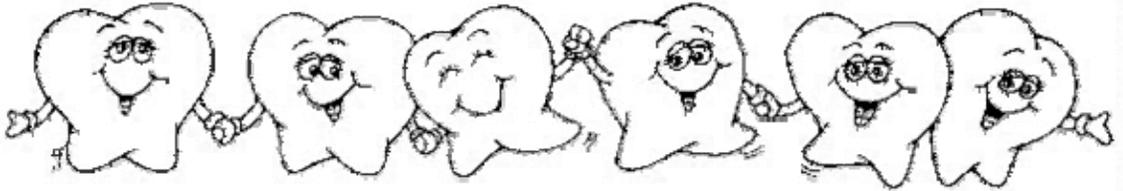


The KU Child Memory Lab
needs parents and 3 to 5-year-old children who are having their first trip to the dentist
for a study on parent child talk and children's memory for the dental exam.

We offer:
\$20 cash
Thank-you gifts for child participants and siblings

Interested?
Call or email Alisa
(218-9968 or azalisa@ku.edu)

Please call before your scheduled appointment!



Appendix B

INFORMED CONSENT STATEMENT

Parent-Child Narratives Before, During and After a Dental Exam

INTRODUCTION

The Department of Psychology at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. Please be aware that even if you agree to participate, you can withdraw at any time. If you do withdraw from this study, it will not affect your relationship with the dental office, the services it may provide to you, or with the University of Kansas.

PURPOSE OF THE STUDY

For this project we are interested in children's reactions to and memories for a novel event, and how they are related to parent-child interactions before, during and after the event. The event we have chosen for this study is a child's first visit to the dentist, as this can be a mildly stressful experience for some children. We are also interested in how children's memories for the visit might be related to child characteristics such as temperament or language ability.

PROCEDURES

For this project, we will be meeting with children between the ages of 3 and 5 years of age who are scheduled for their first visit to the dentist, and one of their parents (the primary or co-caregiver). Before the dentist appointment, we will provide you with a tape recorder and we will ask you to tape record the ride to your child's visit to the dentist. We will supply you with a vest that holds the recorder that your child can wear during the car ride. If your child does not want to wear the vest, you may place it on the floor next to him or her. When you arrive at the dentist office a research assistant will greet you and give you a brief questionnaire about background information (e.g., child age and ethnicity), your child's past experiences with dentists and your child's stress level during the exam; you can complete this questionnaire during or after the exam. The dental hygienist will then videotape your child's dental exam so that we can get an accurate record of what happened during the visit. The hygienist will also be asked to rate your child's stress level before and during the exam. After the visit, the research assistant will retrieve the questionnaire from you and ask you to record the car ride to your house or your next destination.

Approximately one week after the dental visit, the research assistant will meet with you and your child either in your home or at a university laboratory, depending on your preference. During this visit, we will also ask you to fill out three questionnaires: (1) one about events that have taken place after your child's dentist visit; (2) one about your child's personality and typical behaviors and (3) one about your relationship with your child. While you are completing these questionnaires, a

research assistant will ask your child about his/her visit to the dentist. Because children's language abilities might be related to what they can tell us about their visits to the dentist, we will give your child a brief language test after the memory interview. Finally, we will also ask you and your child to talk about a shared past event (not the dental exam) to provide another measure of parent-child interactions. We will videotape this conversation, as well as the memory interview about the dental exam. The visit should approximately take 1 hour.

Each participant will be assigned an identification number. All information collected about participants will be identified only by this number and not by name. A master list will link participants' identifying information with data from measures and questionnaires, and only the principal investigators will have access to this list (it will be kept on a password protected computer file). All data collected, including the paper forms, audiotapes and video tapes, will be stored in a locked file cabinet in a locked laboratory. The audiotapes and videotapes will be stored indefinitely in a locked file cabinet in a locked laboratory.

RISKS

There are no anticipated risks for participating in this study.

BENEFITS

Most children seem to enjoy the chance to "make a movie" with the research assistant. In addition, the results of this study may provide information for dentists and parents about how to best prepare children for their first visit to the dentist.

PAYMENT TO PARTICIPANTS

You will be given \$20 for your time during the home/laboratory visit and we will give your child a small prize. Investigators may ask for your social security number in order to comply with federal and state tax and accounting regulations.

INFORMATION TO BE COLLECTED

To perform this study, researchers will collect information about you and your child. This information will be obtained from: your answers to the questionnaires listed in the Procedures section of this consent form, the videotape of the dental exam conducted at the dentist office, the brief questionnaire about your child's stress level completed by the hygienist, the audio-recordings of the car conversations to and from the dentist office and your child's responses to the language assessment and the memory interviews.

Your name will not be associated in any way with the information collected about you and your child or with the research findings from this study. An identification number instead of your name will identify all information collected. The information collected about you will be used by: Dr. Andrea Greenhoot and members of the Child Memory Lab at the University of Kansas and KUCR and officials at KU that oversee research, including committees and offices that review and monitor research studies. It is possible that some health information may be recorded on the videotape of the

dental exam. Some persons or groups that receive your health information as described above may not be required to comply with the Health Insurance Portability and Accountability Act's privacy regulations, and your health information may lose this federal protection if those persons or groups disclose it.

The researchers will not share information about you with anyone not specified above unless required by law or unless you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future. Again, your name would not be associated with the information disclosed, and the researchers will not share information about you with anyone not specified above unless required by law or unless you give written permission.

INSTITUTIONAL DISCLAIMER STATEMENT

Although no risk is expected, in the event of injury, the Kansas Tort Claims Act provides for compensation if it can be demonstrated that the injury was caused by the negligent or wrongful act or omission of a state employee acting within the scope of his/her employment.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. In addition, you may refuse to do so without affecting your right to any services you are receiving or may receive from the dentist office or to participate in any programs or events of the dentist office. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you, in writing, at any time, by sending your written request to: Andrea Greenhoot, Department of Psychology, 1415 Jayhawk Blvd. 537 Fraser, Lawrence, KS 66045. If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study and the use

Appendix C

Protocol for various interactions with children during study

Note to experimenters: It is absolutely mandatory that each child regardless of age be given the opportunity to decline participation in the research. The following script provides a suggested way to obtain verbal consent from the children. Of course, this suggested procedure must be used with flexibility to accommodate individual behavior among the parents and the children. However, each child must be explicitly asked whether or not he or she wishes to take part in the research, and the child's wishes must be respected.

Initial contact prior to dental visit: *(If the child is unavailable the day the experimenter gives the vest, tape-recorder and tape to the parent, the parent should be informed that the child does not have to wear the vest if he/she does not want to and that the tape-recorder should just be placed on the floor of the car.)*

If the child is available at the initial meeting, the experimenter should obtain verbal assent to participate in the study at that time. The experimenter should introduce himself or herself to the child and ask for assent according to the following protocol:

Interviewer: "Hi [Child's name], thank you for letting me come see you [coming to see me] today. I want to know about children's first visit to the dentist. I am having kids wear neat vests on the way to the dentist and then we make a movie of the visit. Later on my friend or I will come to children's homes and do some fun stuff. Your [mommy, daddy] said it was OK for you to participate in the study. Is that OK with you too?"

[If child says "yes"]: Great. Is it OK if you wear a neat vest in the car ride to the dentist office? Would you like to pick a vest out and try it on?

[If child says 'yes']: Great. Which one would you like?

[If child says "no" to wearing a vest]: That is alright. I will give it to your parent to just take in the car with you.

[If child does not respond or is hesitant about wearing a vest]: You can think about it. Would you like to pick one out? If you do not want to wear it, that is okay.

[If child says 'no']: Well that is OK. Some children do not feel like participating. It was nice to meet you.

Session 1-dentist office-if first time contact with child and parent: The experimenter will meet the child for the **first time** at the dentist office accompanied by the participating parent. At this time, the experimenter should introduce himself or herself to the child. The experimenter will then tell the child that his/her mommy or daddy agreed that they could be a part of a fun project we doing about your first visit to the dentist.

Interviewer: "Hi [Child's name]. It is nice to meet you [see you again]. I want to know about children's first visit to the dentist and make a movie of children's first visit to the dentist. Later on my friend or I will come to children's homes and do some fun stuff.

Your [mommy, daddy] said it was OK for you to participate in the study. Is that OK with you too?"

[If child says "no"] That is all right sometimes children do not feel like participating. The experimenter will then ask the parent if the car ride was recorded and ask for the tape. The tape will be destroyed and no further data collection will take place.

[If child says "yes"] Great. I will go set up the camera to make the movie. The experimenter will ask the parent if the car ride was recorded and remind them that the visit will be videotaped. After the visit, the experimenter will remind the parent to record the car ride home or to their next destination.

Session 1-if an experimenter saw child prior to dentist visit: The experimenter will meet the child at the dentist office accompanied by the participating parent. At this time, the experimenter should introduce himself or herself to the child. The experimenter will then tell the child that his/her mommy or daddy agreed that they could be a part of a fun project we doing about your first visit to the dentist.

Interviewer: "Hi [Child's name], thank you for letting me come see you [coming to see me] today. My job is to find out about children's first visit to the dentist. Today we will be making a movie of your first visit. Your [mommy, daddy] said it was OK for us to make the movie. Is that OK with you too?"

[If child says "no"/ declines] That is all right sometimes children do not feel like making a movie. The experimenter will then ask the parent if the car ride was recorded and ask for the tape. The tape will be destroyed and no further data collection will take place.

[If child says "yes"] Great. I will go set up the camera to make the movie. The experimenter will ask the parent if the car ride was recorded and remind them that the visit will be videotaped. After the visit, the experimenter will remind the parent to record the car ride home or to their next destination.

[If child is hesitant but does not decline] "It's OK if you want to think about it for a little while. How about if I set up my video camera and then I can ask you about this a little later. [After setting up camera, interviewer repeats initial question. Experimenter must obtain child's consent before beginning the procedure].

Session 2-home/lab visit, contact with child and parent: Typically the experimenter will meet the child for the first time in his or her home (or laboratory room) accompanied by the participating parent. At this time, the experimenter should introduce himself or herself to the child. The experimenter should then spend a few minutes establishing rapport with the child [e.g., discussing the child's shoes etc...]. The following conversation for obtaining assent should take place once rapport has been established and before the parent-child talk begins:

Interviewer: "Hi [Child's name], thank you for letting me come see you [coming to see me] today. My job is to see how parents and children talk about past events and also ask you some questions about your first trip to the dentist and play some games. So I ask [mom, dad] to talk with their children, and then I ask the children some questions about the dentist visit. I tape the whole thing on my video camera. Your [mommy, daddy] said it was OK for me to ask you some questions about how you and your [mom,dad] talk. Is that OK with you too?"

[If child says "yes"] "Good! Let's find a place for your [mommy,daddy] to talk to you, and we'll set up my video camera."

[If child is hesitant but does not decline] "It's OK if you want to think about it for a little while. How about if I set up my video camera [alternatively, "we play for a little while"], and then I can ask you about this a little later. [After playing with child and/or setting up camera, interviewer repeats initial question. Experimenter must obtain child's consent before beginning the procedure].

[If child declines participation] Interviewer: "Sometimes, children just don't feel like having mom and dad talk with you and being asked questions. That's OK. It was nice to meet you, [Child's name]."

Interviewer will then ask parent to nominate a shared, past one-time event that had happened less than one-month ago and spanned no more than one-day.

Prior to the Memory Interview:

Interviewer: "Now that your [mommy,daddy] and you have talked, I would like to come talk to you and then we can play a word game. I want you to try to tell me about your trip to the dentist. Is that ok? We are going to be making a movie of this. Is that alright with you?"

[If child says "yes"] "Good! Experimenter should then proceed, "I know that you went to the dentist. I don't know what happened though, and I was hoping you could tell me about it.

[If child declines at any point] "That's OK. Sometimes children just don't feel like trying to remember what happened when they went to the dentist. Thanks for all the help you have given me!"

Following the session, child is asked if he or she wants to ask the experimenter about anything they talked about. Experimenter answers child's questions simply and

honestly. Child is praised for his or her performance and thanked for helping the experimenter.

Appendix D
PARENT QUESTIONNAIRE
(to be filled out/asked the day of the dental visit) ID_____

Background Information

Instructions: In order to better interpret children's memory performance; it would be very helpful for you to provide us with some background information.

Please provide the following information:

Child's Age: _____

Child's Gender: _____ Child's Date of Birth: _____

Child's Ethnicity: _____

Your relationship to the child: ___ mother ___ father ___ guardian

Mother's (or guardian's) Occupation: _____

Years of Education:

- ___ completed graduate degree
- ___ college graduate
- ___ some college, no degree
- ___ high school graduate or vocational school
- ___ partial high school (more than 9th grade)
- ___ junior high school (completed 7th – 9th grade)
- ___ less than seven years of school

Father's Occupation: _____

Years of Education:

- ___ completed graduate degree
- ___ college graduate
- ___ some college, no degree
- ___ high school graduate or vocational school
- ___ partial high school (more than 9th grade)
- ___ junior high school (completed 7th – 9th grade)
- ___ less than seven years of school

Do you have any other children in your family? If so, please indicate the date of birth and gender of each child below.

Date of birth Gender of child

Questions about today's visit:

1. Did you provide any incentives (rewards) to your child for going to the dentist today?

(circle one) Yes No

If yes, what reward are you giving?

2. Has your child visited the dentist before (going with you and/or older siblings)?

(circle one) Yes No

3. Has your child seen the dentist before?

(circle one) Yes No

If yes, how long ago and what was the reason for the visit?

4. How nervous or anxious was he/she on a scale of 1 to 5 with 5 being extremely nervous or anxious?

1	2	3	4	5
Not at all	Not very	Some	Very	Extremely

*****fill out after your child's exam*****

During the exam, how nervous or anxious was your child during the exam on a scale of 1 to 5 with 5 being the most nervous/anxious you have seen your child?

1	2	3	4	5
Not at all	not very	some	very	the most you have seen

After the exam, how nervous or anxious was your child during the exam on a scale of 1 to 5 with 5 being the most nervous/anxious you have seen your child?

1	2	3	4	5
Not at all	not very	some	very	the most you have seen

Appendix E

List of Possible Components and Extra-event components

List of 28 Possible Components Asked about

Child sits in the chair
Child wears a bib
Child smiles for hygienist
Gloves (hygienist and dentist)
Child leans back in chair
Hygienist puts her fingers in child's mouth
Hygienist counts teeth
Hygienist pokes teeth
Hygienist uses mirror
Child picks flavor of polish
Tickly brush on child's teeth
Spray water in child's mouth
Suck water from child's mouth with Mr. Slurpy the straw
Fluoride on child's teeth
 Child looks like a football player (fluoride mouth guard)
 Fluoride painted on child's teeth
Pictures of child's teeth (x-ray)
Child wears a x-ray jacket
X-ray machine goes in child's mouth
Dentists look at pictures of teeth
Dentist put on gloves
Dentist counts teeth
Dentist pokes teeth
Dentist uses pick
Dentist put fingers in child's mouth
Child gets a sticker
Child gets a tooth brush
Child gets floss
Child gets book

List of Possible Events Asked About

Start of exam:

 Sit in chair (alone or with mommy/daddy)
 Child wears bib
 Lie in chair
 Hygienist puts on gloves
 Child put on glove
 Smile

Oral exam:

 Open wide
 Hygienist counts teeth
 Hygienist pokes at teeth (uses pick/tooth explorer)

Polish:

- Tickly brush on teeth
- Water gun rinses teeth
- Hygienist sprays water gun
- Mr. Slurpy straw sucks mouth

Fluoride:

- Hygienist brushes on fluoride with a paint brush
- Hygienist gives you mouth guard with fluoride to look like a football player

X-ray:

- Hygienist puts x-ray jacket on child/child wears jacket
- X-ray machine goes in mouth
- Get pictures of teeth taken

Dentist:

- Dentist puts on gloves
- Dentist counts child's teeth
- Dentist pokes teeth (uses tooth explorer)
- Look at teeth pictures with dentist
- Dentist's fingers in mouth
- Dentist takes off gloves
- Hygienist takes off gloves

Prize:

- Hygienist/Dentist gives sticker
- Hygienist/Dentist gives toothbrush
- Hygienist/Dentist gives flosser
- Pick out small toy in treasurer chest
- Pick out book

List of Additional Possible features children brought up during Memory Interview

- Chair moves up/down
- Child wears sunglasses
- Hygienist wears mask
- Hygienist puts on gloves and mask
- Hygienist opens up bag of tools

Oral Exam

- Hygienist uses mirror
- Hygienist turns on light
- Hygienist fingers in the child's mouth
- Hygienist sprays air

Cleaning/Polish

- Child chooses flavor of polish
- Tickly brush on finger
- Child spray water gun
- Child uses Mr. Slurpy

Fluoride treatment

- Child chooses flavor of fluoride

X-ray

- Child gets film put in mouth
- Child bit tongue
- Additional oral exam
 - Dentist wears mask
 - Dentist uses mirror
 - Dentist sprays air
- Take home
 - Child gets toothpaste

List of Extra Event Components asked about during the Memory Interview

- Start of Exam
 - Hygienist looks thru child's hair
 - Hygienist stamps child's hand
- Oral Exam
 - Hygienist cleans child's nose
 - Hygienist looks in child's ears with a light
 - Hygienist counts child's fingers
- Cleaning/Polish
 - Child spits in cup
- Fluoride treatment
 - Hygienist gives child shot
- X-ray
 - Hygienist takes x-ray of child's hand
- Additional Oral Exam
 - Dentist listens to child's heart with a stethoscope
- Take home
 - Child gets a comb
 - Child gets a candy
 - Child gets a t-shirt

Appendix F

HYGIENIST QUESTIONNAIRE

Child ID _____

Date _____

1. How nervous or anxious was the child *before the start of the exam* on a scale of 1 to 5 with 5 being the extremely nervous/anxious?

1	2	3	4	5
Not at all	Not very	Some	Very	Extremely

2. How nervous or anxious was the child *during the exam* on a scale of 1 to 5 with 5 being the most nervous/anxious you have seen your child?

1	2	3	4	5
Not at all	Not very	Some	Very	Extremely

3. How nervous or anxious was the child *after the exam was over* on a scale of 1 to 5 with 5 being the most nervous/anxious you have seen your child?

1	2	3	4	5
Not at all	Not very	Some	Very	Extremely

4. Compared to other children his/her age, how nervous or anxious was he/she on a scale of 1 to 5 with 5 being the most nervous/anxious you have seen your child?

1	2	3	4	5
Calmer than all	Calmer	Neutral	Anxious than most than most	One of the worst cases of anxiety/nerves

Appendix G
ELICITED REMINISCING PROTOCOL
(done day of the home/lab visit)

“Today we will be asking you and your child to discuss a recent shared event that happened between last week and one-month ago. We would like this event to be something unique that lasted no more than a couple of hours. For example, you could talk about when your child swam for the first time, a trip to the zoo, swinging at the park for the first time, or visiting the pet shop for the first time. We also ask that you do not talk about the trip to the dentist because we will be asking your child about that today after this activity. Do you think you have an event to discuss? Do you have any questions? “

Event 1 selected:

Delay:

Event 2 selected:

Delay:

After event selection.

“Now we would like you and your child to talk about this event and I will not be in the room. Talk about this event as you normally would to your child. There is no length requirement for how long to talk-the conversation can be as long or as short as you would like. When you are finished, I will be waiting in the _____ room.”

**APPENDIX H:
MEMORY INTERVIEW**

- (1) "What happened when you visited the dentist one week ago?"
OE1
a. For each event mentioned but not completely elaborated, ask:
"How did that happen?"
If necessary, follow-up with:
"Can you tell me more about that?"
OE2
b. Follow-up with:
"What else happened?" Ask as many times as necessary.
OE2
- (2) "What happened at your first visit to the dental office with _____, the first person you saw?"
OE1 a. If not completely elaborated, ask:
"How did that happen?"
If necessary, follow-up with:
"Can you tell me more about that?"
OE2
b. Follow-up with:
"What happened after that?" Ask as many times as necessary.
OE2
- (3) "What happened when you sat in the chair?"
OE2
a. If not completely elaborated, ask:
"How did that happen?"
If necessary, follow-up with:
"Can you tell me more about that?"
OE1
b. Follow-up with:
"What happened after that?" Ask as many times as necessary.
OE1
c. Yes/No questions
Did you sit in the chair by yourself?
Did you wear a bib?
Did you smile for _____?
Did _____ stamp your hand?
Did _____ put on gloves?
Did you lean back in the chair?
Did _____ look through your hair?
- (4) " What happened when _____ asked you to open your mouth?"
OE2 a. If not completely elaborated, ask:

"How did that happen (or how did s/he do that?)"

OE2

If necessary, follow-up with:

"Can you tell me more about that?"

OE2

b. Follow-up with:

"What happened after that?" Ask as many times as necessary.

OE2

c. Yes/No questions:

Did _____ put his/her fingers in your mouth?

(5) " Did s/he use any tools?"

a. "What did s/he do with her tools?"

OE3

b. If not completely elaborated, ask:

"How did that happen (or how did s/he do that?)"

OE2

If necessary, follow-up with:

"Can you tell me more about that?"

OE2

c. Yes/No questions:

Did _____ count your teeth?

Did s/he poke at your teeth?

Did s/he use a mirror?

Did s/he count your fingers?

Did s/he clean your ears?

Did s/he look in your ears with a light?

(6) " What things did _____ put on your teeth?"

OE2

a. If not completely elaborated, ask:

"How did that happen (or how did s/he do that?)"

If necessary, follow-up with:

"Can you tell me more about that?"

b. Follow-up with:

"What happened after that?" Ask as many times as necessary.

OE2

c. Yes/No questions

Did you pick out a flavor of polish?

Did _____ use the tickly brush on your teeth?

Did s/he clean your ears?

Did _____ spray water in your mouth?

Did you suck water from your mouth with Mr. Slurpy the straw?

Did you spit in a cup?

(7) " Did _____ put anything else on your teeth?"

OE2

a. If not completely elaborated, ask:

"How did that happen (or how did s/he do that?)"

If necessary, follow-up with:

"Can you tell me more about that?"

b. Follow-up with:

"What happened after that?" Ask as many times as necessary.

OE2

c. Yes/No questions

Did you get a fluoride on your teeth?

Did _____ make you look like a football player?

Did _____ give you a shot?

(8) "Did Ginny do anything else with your teeth?"

OE1

a. If necessary, follow-up with:

"Can you tell me more about that?"

OE2

b. Follow-up with:

"What happened after that?" Ask as many times as necessary.

OE2

c. Yes/No questions

Did s/he take pictures of your teeth?

Did you wear a x-ray jacket?

Did the x-ray machine go in your mouth?

Did s/he take pictures of your hand?

Did the dentist, the second person, look at pictures of your teeth?

(9) " What did the second person, the dentist do?"

OE2

a. If not completely elaborated, ask:

"How did that happen or how did s/he do that?"

OE2

If necessary, follow-up with:

"Can you tell me more about that?"

OE2

b. Follow-up with:

"What happened after that?" Ask as many times as necessary.

OE2

c. Yes/No questions

Did the dentist put on gloves?

(10) " Did the dentist use any tools?"

a. "What did s/he do with his/her tools?"

OE3

b. If not completely elaborated, ask:

"How did that happen (or how did s/he do that?)"

OE2

If necessary, follow-up with:

"Can you tell me more about that?"

OE2

- c. Yes/No questions:
 - Did s/he count your teeth?
 - Did s/he poke at your teeth?
 - Did s/he use a pick?
 - Did s/he listen to your heart with a stethoscope?
 - Did the dentist put fingers in your mouth?

- (11) "Did _____ or the dentist give you anything to take home?"
 - a. "What did you get to take home?"

OE3

- b. Follow-up with:

"What happened after that?" Ask as many times as necessary.

OE2

- c. Yes/No questions:
 - Did you get a sticker?
 - Did you get a book?
 - Did you get a t-shirt?
 - Did you get a tooth brush?
 - Did you get floss?
 - Did you get a comb?
 - Did you get candy?

- (12) "Can you remember anything else that happened?"

OE1

- a. If necessary, follow-up with:

"Can you tell me more about that?"

OE2

- b. Follow-up with:

You did a great job. We are all done.

**Appendix I:
Discussions about the Dental Exam**

Child ID:

Date:

We have a couple of questions for you related to your child's visit to the dentist office. Please answer the following questions:

1. Did your child talk this past week about the dentist visit?
 - a. If yes, how many times and about how long was each time?

2. Did you talk with your child about the dentist visit that was a week ago?
 - a. If yes, how many times and about how long was each time?

3. If yes to either 1 or 2, what sorts of things were discussed?

RA will say "Now, while I am asking your child about the dentist visit, I have a couple of forms for you to fill out. These are letting us get a better understanding of your child's behavior, your time as a parent and the relationship you have between your parent and child. If you have any questions about the forms, I can answer them after the memory interview. Thank you and here are the forms. "

Appendix J Coding Manual for Elicited Reminiscing Task

Adapted from Fivush Lab Coding Manual and Haden Coding Manual

This is a mutually exclusive and exhaustive hierarchical coding scheme in which each utterance is coded into 2 categories as well as calculating the number of new details. An utterance is defined as a subject-verb construction (subject can be implied). Each utterance is first coded for conversational function. Then each utterance is coded for whether it is attempting to get on topic or is on topic about the specific emotional event being discussed. Each utterance is then further coded for whether it refers to the event itself or the emotional aspects of the event.

I. On Topic/Off Topic

- * **On Topic (ON)** – Someone proposes a topic and it is discussed.
- * **Off Topic (OFF)**-Topic is not relating to what mother had elected as event to discuss. Within the event conversation, instances when the event is not the topic of discussion.

Note that OFF is the default in bouts of off topic when you are trying to decide between OFF and Unclassifiable.

II. Function

- * **Elaboration (ELAB)**– memory information that is new to the conversation, if it has been said by either participant before utterance is counted as a repetition. Rely on punctuation to separate elaborations. **Can be questions or statements.**

Example:

Mother: We played on the swings, didn't we? Did we go down the slide too?
This example would count as two elaborations as long as the information had not been discussed before (i.e. no mention of swings or going down the slide earlier in the conversation)

If elaborative statement is asked as a question, indicate elaborative questions was yes-no or open-ended.

Examples Open-ended elaborations: questions that ask the child to respond in other than a yes-no statement.

“What did we do at the zoo?”

“Tell me what happened at the zoo?”

“Where you awake or asleep when we drove to Grandma's?”

Yes-No elaborations: Yes-No questions that ask the child to confirm or deny a new piece of information provided by the mother.

“Remember what we did when we went to the pumpkin patch?”

Elaborations can also be statements: Any declarative comment that provides new information about the event. Unlike questions, statements do not

“demand” a response. Statements that provide new information about the event.

- * **Repetition (REP)**– memory information that has already been established in the conversation, regardless of who has provided the information. Cannot count a repetition that is following its’ initial elaboration, also known as a false start. Repeated statements made back to back in one conversational turn are false starts.

Can be questions or statements.

Example:

Child: I played on the swings

This example would count as a repetition if either the mother or child had already mentioned playing on the swings during the conversation.

- * **Neither (N)**–

Could be confirmation-confirming other person’s previous statement.

Confirmation can be given by repeating the statement or with a yeah, yes etc. The confirmation may be part of a sentence, coding of negation and confirmations do not rely on punctuation

Examples (utterance in bold would count as confirmation):

Child: We went to the carnival

Mother: **We went to the carnival!** What did we do there?

Child: We went to the carnival

Mother: **Yes.** What did we do there?

Could be reconfirmation-when there is a confirmation followed by another.

Example (utterances in bold would count as reconfirmation)

Mother: Were you mad?

Child: Yeah

Mother: **Yeah**

Could be negation-negating previous statement. The negation can be part of a sentence, coding of negation and confirmations do not rely on punctuation, as in the example below, the remaining part of the child’s reply would count as an elaboration.

Example (utterance in bold would count as negation)

Mother: Do you remember when you were playing with Joe at the playground?

Child: **No** it was just me and Sam.

III. Further content of ON-TOPIC TALK: Event/Emotion

If talk is not about the event itself and it is on-topic then it is coded for Associative Talk. Cannot coded as Elaboration or Repetition if coded as Associative Talk.

Associative Talk (AT) - Comments about facts about the world related to the event under discussion (e.g., “Ponies are baby horses.”)
or Talk concerning another past event that is in some way

comparable to the event under discussion (e.g., “We saw fireworks a different night, didn’t we?”).

Emotion (EM): Use of emotion word or emotional behavior such as laughing, yelling, crying, trembling, hugging, kissing etc. Also code an attempt on the part of the mother to elicit the emotion from the child, Ex “How did you feel?” “I was happy/sad/scared/etc”

Evaluation (EVL): Use of evaluative words such as cool and fun. Also code references to fun, liking, favorite part or a good time. Ex “I liked that the best” or “What was your favorite part?”

General Codes:

NR - No Response - Child provides no response, as indicated by a “0” on the transcript. Note that

If the child has a “0” but provides a non-verbal response (head nod, shake), then the “yes” or “no” is coded for the child, rather than a No Response.

UN - Unclassifiable - Include confirmations of a placeholder, an utterance that includes only the

XX or XXX symbols and can’t be determined by the context, or an

Utterance that can not otherwise be classified into one of the above categories. If anything else in the turn can be classified into one of the other categories, do not code unclassifiable portions of the turn.

General Rules

- * **Do not start coding until mother makes an attempt to elicit an event or emotion**
- * **Talk about event that is not specific to the event is considered off topic. This would include talk about the event in another context; an example would be asking the child if they would like to do it again.**
- * **Do not count talk about a future event. Only code for talk about past specific event.**

Appendix K

Coding Manual for Naturally-Occurring Conversations

This is a mutually exclusive and exhaustive hierarchical coding scheme in which each utterance is coded into 3 categories as well as the number of new details. An utterance is defined as a subject-verb construction (subject can be implied). Each utterance is first coded for conversational function. Then each utterance is coded for whether it is attempting to get on topic or is on topic about the specific emotional event being discussed. Each utterance is then further coded for whether it refers to the event itself or the emotional aspects of the event.

Code for :

I. On Topic/On Topic

- **On Topic (ON)** – Discussion of the dental examination or visit to the DCDC
- **Off Topic (OFF)** - This is used to code sections where parent and child are no longer talking about event, in most cases they get distracted with something happening in the present or talking about another event. Within the event conversation, instances when the event is not the topic of discussion. Note that OFF is the default in bouts of off-topic when you are trying to decide between OFF and Unclassifiable.

II. STYLE

- * **Elaboration (ELAB)**– information that is new to the conversation, if it has been said by either participant before utterance is counted as a repetition. Rely on punctuation to separate elaborations. **Can be questions or statements. Include a score of how descriptive the sentence was based on the new pieces of information in it.**

If elaborative statement is asked as a question, indicate elaborative questions was yes-no or open-ended.

Examples Open-ended elaborations: questions that ask the child to respond in other than a yes-no statement.

“What is the dentist going to do today?”

“Tell me what is going to happen?”

“Were the dentist look at your teeth or your nose?”

Yes-No elaborations: Yes-No questions that ask the child to confirm or deny a new piece of information provided by the mother.

“Do you know what is going to happen at the dentist visit today?”

“Remember what we talked about last night?”

Elaborations can also be statements: Any declarative comment made that provides new information about the event. Unlike questions, statements do not “demand” a response. Statements that provide new information about the event.

- * **Repetition (REP)**– information that has already been established in the conversation, regardless of who has provided the information. Cannot count a repetition that is following its’ initial elaboration, also known as a false start. Repeated statements made back to back in one conversational turn are false starts.

Yes-No repetition questions that ask to confirm or deny the **same** information (exact content or gist) as given in a previous comment.

Repetition statements that repeat (exact content or gist) information previously mentioned about the event. Oftentimes, Statement Repetitions are used to summarize what has already been recalled about the event.

- * **Neither(N)**- NOT ELABORATION OR REPETITION

Could be any of the following: Confirmation or Negation– confirming or negating other person’s previous statement. Confirmation or Negation can be given by repeating the statement or with a yeah, yes, no. The confirmation may be part of a sentence, coding of negation and confirmations do not rely on punctuation. Reconfirmation– when there is a confirmation followed by another. Negation– negating previous statement. The negation can be part of a sentence, coding of negation and confirmations do not rely on punctuation, as in the example below, the remaining part of the child’s reply would count as an elaboration. Clarifications – Mother asks explicitly for acoustical clarification. This code does not apply to mother’s request for semantic (meaning based) clarification (What did you say, I can’t hear you, talk louder please, what?, huh? etc.) Indicating memory performance (I forgot, I DK, I can’t remember, I remember that). Saying What? Huh?

III. Content of ON-TOPIC TALK:

If talk is not about the event itself and it is on-topic then it is coded for Associative Talk. Cannot coded as Elaboration or Repetition if coded as Associative Talk.

Associative Talk (AT) - Comments about facts about the world related to the event under discussion (e.g., “Ponies are baby horses.”) or Talk concerning another past event that is in some way comparable to the event under discussion (e.g., “We saw fireworks a different night, didn’t we?”).

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General Codes:

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if the child has a “0” but provides a non-verbal response (head nod, shake), then the “yes” or “no” is coded for the child, rather than a No Response.

UN - Unclassifiable - Include confirmations of a placeholder, an utterance that includes only the

XX or XXX symbols and can't be determined by the context, or an

utterance that can not otherwise be classified into one of the above categories. If anything else in the turn can be classified into one of the other categories, do not code unclassifiable portions of the turn.

General Rules

If XXX on transcript (could not understand), code as unclassifiable. If child does not respond to question (or parent does not respond), code NR for no response.

- * **For the reminiscing assessment,**
 - * **Do not start coding until mother makes an attempt to elicit an event**
 - * **Talk about event that is not specific to the event is considered off topic. This would include talk about the event in another context; an example would be asking the child if they would like to do it again.**