REINSTATEMENT OF PRESCHOOLERS' EVENT MEMORY: THE EFFECTS OF ENCODING AND REMINDING ON RECALL

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ABSTRACT

PRISCILLA SAN SOUCI: Reinstatement of Preschoolers' Event Memory: The Effects of Encoding and Reminding on Recall
(Under the direction of Peter A. Ornstein)

This study was designed to examine the impact of encoding and reminding experiences on preschoolers' event memory performance. Preschoolers between the ages of 42 and 60 months participated in a pretend camping event with an experimenter, and were interviewed about the event 1 day and 6 weeks later. The camping event was staged at their preschool and was comprised of three parts: packing supplies, fishing, and preparing a picnic. To test the effect of encoding on recall, the experimenter's statements during the camping event were scripted to be either "elaborative" or "empty" - styles modeled after the high- and low-elaborative styles of talk that mothers naturally exhibit. Half of the participants were engaged by the experimenter using the elaborative script, and the remaining half were engaged by the experimenter using the empty script. To test the effect of reminding on recall, four weeks after the camping event, half of the participants from the elaborative and empty event conditions were briefly reminded of the event by viewing the objects as they were setup originally. The remaining half of the children from the elaborative and empty event conditions were not reminded of the camping event.

The results indicated that there were no significant effects of event (elaborative, empty), reminder (present, absent), or event x reminder on reporting during the immediate and final memory interviews. The absence of these effects are discussed in terms of several factors, including variability within the sample due to age, the lack of

forgetting during the retention interval, and more broadly, in terms of previous experimenter-child and mother-child reminiscing studies, as well as reinstatement.

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recruitment, offered space, and helped with the logistics of the project. The enthusiasm of these preschools and the children and families who participated is deeply appreciated.

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CHAPTER I: INTRODUCTION

A central tenet of developmental psychology is that the experiences humans have as infants and young children play an important role in shaping adult behavior. This persistence of early experience over the life course is due to our ability to encode, store, and retrieve accounts of past experience. But how is it that we develop the abilities to remember? This is a question of interest to researchers as well as the general public, and for good reason, as our abilities to retain and reflect on detailed information after long delays is a large source of individual difference in our behavior.

It has only been within the past 30 years that researchers have documented that infants and young children have the capacity to encode, store, and retrieve memories of past events (Bauer, 2007). This is one reason why although our memories of experiences are instrumental in shaping behavior, it remains unclear why some memories persist more than others over the course of development. However, it is known that repetition of information can maintain a representation over time (Aristotle, 350BC/1930). Consider for example, how rehearsal can facilitate learned responses by providing additional practice. Beginning in the preschool years, children demonstrate the ability to use rehearsal in the service of long-term recall, and this ability is refined over the course of the elementary school years (e.g. Ornstein & Naus, 1978; Ornstein & Naus, 1985).Yet, it is seldom the case that entire experiences are repeated over multiple occasions, nor do they need to be in order to enhance recall. Rather, it has been suggested that partial repetitions during a delay interval serve to “reinstate” salient aspects of an event by preventing or minimizing forgetting. The notion of reinstatement, originally proposed by Byron Campbell and Julian Jaynes (1966), suggests that a partial

repetition of an initial encoding experience should serve to maintain a memory trace that would typically be forgotten. As such, they postulated that reexperiencing part of an event may serve as a mechanism by which early experiences affect later behavior. Specifically, it has been suggested that reinstatement activates and refreshes an original memory trace, strengthening its retrievability (Howe, Courage, & Bryant-Brown, 1993; Rovee-Collier & Shyi, 1992), but it is also possible that through the process of reinstatement, new information presented during a delay interval alters the original memory trace, thereby strengthening and modifying information in long-term storage (Howe, 1991; Howe & Brainerd, 1989). It may be that both of these perspectives about the function of reinstatement are correct, depending upon the original encoding experience.

The present study was designed to examine reinstatement and event memory in preschoolers, and the impact of both encoding and reminding experiences on long-term retention were tested. Each participant was exposed to the same pretend camping event, though his or her experience differed according to whether the participant was randomly selected to be engaged during the camping event by an experimenter using either an “elaborative” talk or “empty” talk script. The elaborative and empty talk scripts were modeled after high- and low-elaborative styles of conversation that mothers naturally exhibit when reminiscing with their children (see Fivush, Haden & Reese, 2006 for a recent review of this research). A high-elaborative style is characterized by the inclusion of many *Wh-* questions (which provide opportunities for a child to share information about the who, what, where, where, how, and why of the event in an open-ended format), yes-no questions, statements that add new information about an event and also make associations to experiences the child has had before, as well as confirmations and evaluations that praise the child’s participation. Findings from the reminiscing literature illustrate clear concurrent and longitudinal differences between

children of mothers who adopt a “high elaborative” in contrast to a “low elaborative” conversational style in their reporting of past events (e.g., Haden, Haine, & Fivush, 1997; McCabe & Peterson, 1991; Reese, Haden, & Fivush, 1993).

Likewise, in the present study, the experimenter’s elaborative script included a wealth of details about the event being experienced and provided opportunities for the children to share their knowledge and to reflect on the experience as it was ongoing, through the use of open-ended questions. Conversely, the empty script was devoid of these opportunities. It was hypothesized that the half of the sample that was engaged by an experimenter during the camping event with the elaborative script would show elevated levels of recall of the event 1 day and 6 weeks after the event, as compared to the remaining half of the sample who were engaged during the event using an empty event script.

To test the effect of reminding on recall, 4 weeks after the camping event, half of the participants from the elaborative and empty event conditions were briefly reminded of the event by viewing the objects as they were setup originally. The remaining half of the children from the elaborative and empty event conditions were not reminded of the camping event. As such, it was hypothesized that children who received a reminder would better recall the event at the final memory test. Further, it was hypothesized that children in the elaborative event, reminder condition would have the highest level of recall at final test, due to the combination of receiving a wealth of information at the time of encoding and an additional encounter with the event during the retention interval.

Because reinstatement has had limited application in studies of retention in infants and young children, it is important first to explore the origins of this construct, which informed the present study of encoding and reminding in event memory.

The Coining of Reinstatement.

In 1966, Byron Campbell and Julian Jaynes coined the term “reinstatement.” Campbell and Jaynes defined reinstatement as, “a small amount of partial practice or repetition of an experience over the developmental period which is enough to maintain an early learned response at a high level, but is not enough to produce any effect in animals which have not had the early experience” (Campbell & Jaynes, 1966, p. 478). They considered the idea of reinstatement to be somewhat intuitive, in that it is not surprising that partial practice over a delay would serve to maintain a response, and established the efficacy of reinstatement through a systematic series of field maze and operant conditioning experiments in rats.

Campbell’s experiments first demonstrated that young rats have poorer memory for learned experiences than adult rats (Campbell & Campbell, 1962; Campbell, 1967). In their studies, it was suggested that much of the forgetting observed in the neonatal rat was due either to the immature state of the central nervous system at the time of encoding or subsequent neural growth after encoding (Campbell & Spear, 1972). Given that younger animals have poorer memory than older animals, Campbell and Jaynes wondered about how early experiences could lay the foundation for later behavior. Studies of reinstatement demonstrated that responses learned early in life that are typically forgotten over development could be maintained by partial repetition of the original training conditions. It is critical to note that the repetition of experience should be too brief to establish a response without having been exposed to the initial training, yet maintain a response that would ordinarily be forgotten over a long-term delay (Campbell & Jaynes, 1966, 1969). It was thus hypothesized that early experiences are typically forgotten rapidly, and that only those that are reinstated over time become a permanent part of the behavioral repertoire.

Reinstatement of Children's Memory.

Not long after reinstatement effects were demonstrated in animals, the concept was explored in studies of children's memory. Hoving, Coates, Bertucci, and Riccio (1972) using a paired-associate paradigm, divided children aged 5-8 and 8-11 years evenly into groups, and asked them to learn 10 picture pairs to criterion. After a 4-week delay, some of the children were read a story that included the pairs (reinstatement). It was found that at the end of the 8-week interval, younger and older children who had the original training and were read the story at the midpoint of the interval fewer trials to re-learn the list of picture pairs to criterion, in comparison to children in control conditions.
In a follow up study using the same paired-associated procedure, Hoving and Choi (1972) also found that among first graders, presenting the stimulus items alone or embedded among other stimuli did not reinstate memory. Rather, savings in relearning was only exhibited among children who were reinstated with the response items in the original mode of presentation.

The idea that partial repetition of experience can maintain behaviors that would typically have been forgotten generates broad questions for researchers interested in the process of memory development. Indeed, some of the major questions within the reinstatement literature relate to specifications about reminders, in particular issues related to the type, timing, and intensity of a reminder (Spear & Parsons, 1976).

Reinstatement and the Conjugate Mobile Paradigm.

Carolyn-Rovee Collier's studies of operant conditioning in infancy using the conjugate mobile paradigm have been instrumental in promoting the application of reinstatement to human memory. In the conjugate mobile paradigm, an infant - typically between 3 and 6 months of age – is placed on her back with a mobile overhead. After an operant period in which the infant's base level of kicking is measured, her leg is connected via a ribbon to the mobile. With this arrangement, each kick is followed by the

reinforcement of observing the mobile move, and stable responding in its presence can easily be established. With the operant response acquired, remembering after varying intervals can readily be assessed under conditions of extinction in which the ribbon is disconnected from the mobile, so that no contingencies are in effect. Memory is then inferred if the rate of kicking observed in these test periods is greater than that seen in the baseline period, and under these conditions two fundamental patterns of age differences in performance in the first six months of life have been reported: both speed of learning and length of retention increase with age (see Rovee-Collier et al., 1980).

Through a systematic examination of retention in early infancy using the conjugate mobile paradigm, Rovee-Collier has demonstrated among infants that memories that seem to be forgotten can be cued and recovered over the first two years of life. By using reinstatement, retention of the kicking response can be extended considerably (e.g. Hartshorn, 2003; Sweeney & Rovee-Collier, 2001). Typically, exposure to the mobile (Rovee-Collier et al., 1980) or the context (Rovee-Collier, Griesler, & Earley, 1985) can serve to maintain memory over an extended delay, but the timing of the reminder is of critical importance, with facilitation occurring if a reminder is administered shortly before the assessment of long-term memory, so long as the response has not been completely forgotten (Rovee-Collier et al., 1980; Rovee-Collier & Hayne, 1987; Sullivan, 1982). For example, in 3-month-olds, where forgetting of the kicking response is typically complete after an 8-day delay, Rovee-Collier and her colleagues used reinstatement to maintain responsiveness for as long as 4 weeks by briefly exposing infants to the moving mobile 24-hours before retention testing (Rovee-Collier et al., 1980). In addition, two reinstatement procedures before test have been shown to maintain the kicking response in 3-month-olds for as long as 6 weeks (Hayne, 1990).

Rovee-Collier and her colleagues have also shown that reinstatement can be useful in maintaining other types of conditioned responses. Using an analogous procedure in

which children between the ages of 6 and 24 months are trained to push a lever in order to move a train along its track, continued increases with age in retention has been documented (Hartshorn, Wilk, Muller, & Rovee-Collier, 1998). Periodic reinstatements have been shown to maintain 6-month-olds' memory of the train task for a year and a half, when typically, the response is forgotten after 2 weeks (Hartshorn, 2003).

Reinstatement of Children's Event Memory.

Through Hoving and Rovee-Collier's research, the effectiveness of reinstatement has been demonstrated. However, in order to understand how it is that memory facilitates the impact of early experience on later behavior, it is also necessary to explore how reinstatement of personally experienced event occurs. Yet, studies of reinstatement of children's event memory present challenges unique challenges. First, it is often the case that events are experienced only once, and if they are experienced multiple times, they are usually not exactly the same across instances. Second, from a developmental perspective, repeated experience can be especially challenging for young children, who lack the experience to discern if a novel event is a singular occurrence or the first among a series of similar instances (Nelson, 1990). Thus, it is difficult to know in the case of event memory which aspects of the event would be the most salient, and therefore, the most efficacious reminders. Nevertheless, evidence from the studies of reinstatement of children's event memory indicates that the efficacy of a reminder depends on a number of factors including: the type of event, the length of the retention interval, the timing of the reminder, the type of reminder, and the age of the child. Yet, little is known about the combined effects of these variables, as only a few studies to date have explored the question of reinstatement in event memory.

Given the number of factors that influence the effectiveness of reinstatement, it is not surprising that the most recent studies of the reinstatement of children's event memory have focused on the function of different types of reminder cues. Overall, it seems that

many of the cues used in studies of reinstatement are selected based on the logic that effective retrieval cues, which are presented at the end of a retention interval, should also be effective reminders if they are presented during a retention interval. The use of props and context cues are no exception.

Reinstatement through Props and Context Cues.

In general, viewing props that were present at the time of encoding during final test facilitates retrieval. Bauer, Van Abbema, Wiebe, Cary, Phill, and Burch (2004) for example, have shown that elicited imitation props present at the time of recall are helpful when 3-year-olds are asked to provide a verbal report of a nonverbal event, provided the children were older than 20 months at the time of the initial exposure. This is also the case when older children are given props as retrieval cues. Pipe and Wilson (1994) found that 6-year-olds, who were reexposed to the props and context of a previously viewed magic show during a memory interview, provided significantly more information when recalling the event. It has also been shown that real props are much more effective retrieval cues than toy props in both verbal reports and reenactments (Salmon, Bidrose, & Pipe, 1995; Salmon & Pipe, 1997).

However, there have been very few studies of props and context cues in reinstatement. Yet, given what we know about the efficacy of these types of cues when they are presented during retrieval, it may be that if they are presented during the retention interval, they would be able to attenuate forgetting. The few explorations of props and context cues have been used in combination with a repeated interview in school age children. Gee and Pipe (1995), for example, examined the effects of using objects from a magic show to reinstate 6- and 9-year-old children's memory over a 10-week delay. Approximately half of the 95 children in their sample were interviewed 10 days after the event, and the remaining children were interviewed only after a 10-week delay (control). During the interviews, prompted recall and direct questions included

objects from the event and novel objects that were plausible distracters, as they were features that could have been present during the magic show. Gee and Pipe found that children who had the additional interview with props 10 days after the event did not show decay over the 10 weeks, as they recalled a similar number of details in both interviews.

In addition, Priestley, Roberts, & Pipe (1999) have demonstrated that contextual cues and props aided in 5- to 7-year-olds' long-term recall of a novel "Visiting the Pirate" event. Children participated in the event and were interviewed 3-5 days later. After a delay of six months, the children were interviewed again, but children either had a context reminder 24 hours before the interview, a context reminder at the time of the interview, or a standard interview. During the context reminder that occurred the day before the final interview, the child was taken back to the room where the event had taken place and was allowed to look at the props. During the context reminder at the time of the interview, the child was asked about the event in the room where it had taken place and the props from the adventure were present. In the standard interview condition, children did not see the pirate set or the props the day before, or at the time of the interview. Lastly, a control condition was recruited. These children did not experience the event, but received the context reminder a day before they were interviewed. Priestley et al. (1999) found that the context reminder 1 day before interview aided in recall of the event experienced 6 months prior. It was just as effective as the context reminder that took place during the final interview, and did not adversely affect accuracy. Moreover, because the control group that received the context reminder, and not the original event, showed limited recall, they argued that the positive effects of the context reminder the day before the final interview was due to reinstatement and not new learning.

In sum, although we are beginning to understand how different types of reinstatement can facilitate long-term memory of events, most of our knowledge is based

on only a few studies. However, both Gee and Pipe (1995) and Priestley et al. (1999) indicate that props presented during a retention interval are an effective method of reinstatement, when presented at the beginning and end of a retention interval, respectively. As such, the present study of reinstatement incorporated this as the reminder, which was presented 4 weeks after the original event. The introduction of the reminder at 4 weeks is a departure from both Gee and Pipe (1995) and Priestley et al. (1999), as it occurs a week after the midpoint of 6 week retention interval. In addition, the present experiment was designed to examine the efficacy of a reminder under specific encoding conditions to further our understanding of reinstatement in event memory.

Present Study.

In the present study, the stimulus event was a simulated camping event, an experimenter-child activity that has been used in previous studies of children's memory (Haden, Ornstein, Eckerman, & Didow, 2001; Hedrick, 2006, Ornstein, Haden, & Hedrick, 2004). Although children's memory for this type of experience is typically assessed 1-day and 3-weeks after the adventure, previous studies utilizing this event suggest there is not much of a decline in children's reporting of this event over the 3-week delay. As a result, in this study, the long-term test was extended to 6-weeks.

The camping event was scripted to include either elaborative or empty experimenter talk. This characterization is modeled after experimental research by Pipe (1996; as cited by McGuigan & Salmon, 2004) and McGuigan and Salmon (2004). In these studies, elaborative experimenter talk is based on maternal-child narrative exchanges (see Reese et al., 1993) and includes offering information about materials presented during the event, including the names of objects, and requests information from the child being engaged in the event. Conversely, children who are exposed to empty language during an event are not provided the same level of descriptive information

about the event, nor are they asked to provide this information themselves. In McGuigan and Salmon's study (2004), 3- and 5-year-olds took part in a visit to a pretend zoo with an experimenter, and the effects of empty and elaborative talk, as well as the timing of these different types of talk, were examined. Although children saw the same features during the pretend zoo visit, their experience differed depending on whether the experimenter used an elaborative or empty style of conversation before, during, or after the event. The empty talk script used by the experimenter consisted of a lack of feature labels, description of the features, and an absence of information from the experimenter about the sequence of the event. In contrast, the elaborative talk script offered feature labels and specific details about the features and the event. The results of this manipulation indicated that children who were exposed to the elaborative script had fewer errors in reporting after a two week delay. In addition, 5-year-olds who had been exposed to the elaborative script showed higher levels of open-ended recall.

Hedrick (2006; Hedrick, Haden, & Ornstein, in press), incorporated these types of talk into scripts for the pretend camping event and found differences in 4-year-olds' recall depending on whether they had elaborative or empty talk as the event unfolded. The present study incorporated the same elaborative and empty scripts for the same camping event, to further test their efficacy. Yet, the present study is a departure from this and other previous studies of event talk, as it involved the implementation of a reminder during a retention interval.

Regarding the event talk manipulation in the present study, it was hypothesized that given that the elaborative talk script offered more information and scaffolded opportunities for children to reflect on the event as it was ongoing, children who were engaged by an experimenter using the elaborative script would show elevated levels of recall of the event 1 day and 6 weeks after the event, as compared to children who were engaged by an experimenter using an empty event script. It was also hypothesized that

children who received a reminder would better recall the event at the final memory test. This was because the reminder offered additional exposure to the event 4 weeks after it had occurred. Regarding the combined effect of encoding and reminding, it was hypothesized that children in the elaborative event, reminder condition would have the highest level of recall at final test, as they received a wealth of information at the time of encoding and an additional encounter with the event during the retention interval.

CHAPTER II: METHOD

Participants.

A total of 71 children between the ages of 42 and 60 months were recruited from five preschools in the Chapel Hill/Durham, North Carolina area. With the permission of each preschool's administrator, children between the age of 42 and 60 months were sent home an invitation packet to participate in the study. The packet included an invitation letter that described the study, and two copies of a consent form that provided additional information about the procedure, the minimal risks and benefits associated with participation, and the principal investigators' contact information. The packet also included a postage-paid envelope. Copies of the invitation letter and the consent form are included in Appendices A and B. Families who opted to participate in the study signed and returned one copy of the consent form. Of the families who received the invitation letter, approximately 27% participated in this research project. Participants were randomly assigned to the experimental groups, though gender was balanced across conditions.

There were no exclusion criteria at the time of enrollment for the study. However, 5 of the 71 children recruited were not included in final data analysis. Of these 5 children, two chose not to participate in the camping event and withdrew from the study. Two additional children, who were non-native English speakers, did not reach basal on the language measures. A fifth participant was excluded because it was noted in the demographic questionnaire that she was possibly developmentally delayed and was receiving an unspecified type of therapy. These exclusions resulted in a final sample size of 66.

Children in the final sample ranged in age from 42 to 60 months (*M* = 52.45, *SD* = 5.06). Thirty-two of the children were female; 34 were male. There were no differences between the conditions in gender or average age distribution. Among the 91% of families who completed a demographic questionnaire, approximately 80% of the children were Caucasian, 7% were Asian or Pacific Islander, 2% were African-American, and 2% were multi-racial (e.g. African-American and Caucasian). In addition, approximately 88% of the mothers in the sample had earned at least a bachelor's degree. Appendix C includes a copy of the questionnaire that families were asked to complete in order to obtain demographic information about the participants and their families.

As a token of appreciation for participating in the study, the children were given stickers, a book, and a small gift, and at the end of data collection, each preschool was given $25 worth of books and educational games. In order to inform the preschools and families of the major findings of the study, a newsletter will be created and distributed.

Experimental Design

This study is structured as a 2 x 2 factorial design, with event condition (elaborative vs. empty) and reminder (present vs. absent) as independent factors. Tables 1 and 2 provide an overview of the factorial design, the resulting four experimental groups (Table 1), and their treatment (Table 2).

Table 1
Factorial Design and Resulting Experimental Groups.

		Reminder	
		Present	Absent
Event Condition	Elaborative	Elaborative event, reminder *n* = 17	Elaborative event, no reminder *n* = 16
	Empty	Empty event, reminder *n* = 16	Empty event, no reminder *n* = 17

Table 2
Treatment of Experimental Groups.

	Elaborative event, reminder	Elaborative event, no reminder	Empty event, reminder	Empty event, no reminder
Visit 1 (Day 1)	Language Assessment Elaborative Camping Event	Language Assessment Elaborative Camping Event	Language Assessment Empty Camping Event	Language Assessment Empty Camping Event
Visit 2 (Day 2)	Immediate Interview	Immediate Interview	Immediate Interview	Immediate Interview
Visit 3 (Day 28)	Reminder	No Visit	Reminder	No Visit
Visit 4 (Day 42)	Final Interview	Final Interview	Final Interview	Final Interview

As outlined in Table 2, the study lasted six weeks for each child, and required three to four visits. Regardless of experimental condition, during the first visit, each child was administered language measures and then took part in the pretend camping event. The child was interviewed about this camping event one day and six weeks later. However, each child's experience differed depending on whether during the first visit, the experimenter engaged the child using empty or elaborative talk during the camping event, and whether or not after 4 weeks, the child received a reminder of the camping materials. If a child was randomly selected to receive the reminder, he or she participated in four visits during the study, whereas children who were not selected to receive the reminder participated in three visits.

To reduce variability in the instantiation of the treatment at encoding, the same experimenter administered all of the camping events. Seven other experimenters were trained to administer the language assessments, memory interviews, and reminder so that each child never worked with the same experimenter twice during his or her three to four visits of the study.

Materials and Measures.

This study featured the use of a specially constructed event, a camping trip that was designed to be novel, yet assessable to the children participating in the project. The camping trip was scripted to be either "elaborative" or "empty" - styles modeled after the high- and low-elaborative styles of talk that mothers naturally exhibit. In addition, language assessments, a hierarchical memory interview, and a demographic questionnaire were included. These materials and measures are described below.

Camping Event. The camping event in this study is procedurally similar to the camping adventure developed by Haden et al. (2001). Both the Haden et al. (2001) camping trip and the camping trip in this study are specially constructed activities that include features typically seen and used during an actual camping trip, though the

features were selected to be child-friendly and portable, as the event was used at each of the five preschools in the study. The 27 camping features are listed in Appendix D, and are similar to items used by children in pretend play.

Elaborative and Empty Event Scripts. The experimenter's elaborative and empty scripts for the camping event are modeled after maternal styles of conversation that have been widely documented in the literature and that have a lasting impact on children's memory performance (e.g. Reese et al.,1993), and are included in Appendix E and F. The elaborative script (Appendix E) highlights specific details about the camping features and was structured to elicit new information from the child. This included asking various *wh-questions* about the scripted and the unscripted features to which the child attended, making *associations* between camping and other experiences with which the child may be familiar, and providing *positive evaluations* of the child's contributions to the event. Below is an example of an experimenter-child exchange in the elaborative event condition:

Child: "I love cheese!" *child picks up the cheese*

Experimenter: "What kind of cheese is that?"

Child: "Swiss cheese."

Experimenter: We can use that cheese to make cheeseburgers.

As this example illustrates, the experimenter maintained the elaborative conversational style, in concurrence with the child's statements and actions, thus preserving the integrity of the information-seeking style of the script while being flexible enough to accommodate to the child's contributions to the event.

In contrast, the empty script (Appendix F) is devoid of opportunities for the experimenter to support children's understanding of the event. As such, the children in the empty condition are not asked a variety of *wh-questions*, *associations* between the present and past experience are not offered, and *positive evaluations* of children's

contributions to the event were kept to a minimum. Below is an example of an experimenter-child exchange in the empty event condition:

Child: “Cheese.” *Child picks up cheese and gives it to the experimenter*

Experimenter: “Do you like cheese?”

Child: “Yes!”

Experimenter: “I’ll carry this.”

As this example illustrates, the experimenter consistently maintains a low-elaborative conversational style in concert with the child’s statements and actions, thus preserving the empty style of the script, while also recognizing the child’s contributions to the event.

The elaborative and empty event scripts in the present study were created for a previous study that successfully manipulated children’s encoding of the camping event through conversational exchanges (Hedrick, 2006; Hedrick et al., in press). In this previous study, the experimenter engaged children in either an elaborative conversation during the camping event and an elaborative conversation after the event, an elaborative conversation during the camping event and an empty conversation after, an empty conversation during the camping event and an elaborative conversation after, or an empty conversation both during the camping event and after. The results indicated that a highly elaborative conversation style during camping positively affected children’s recall of the event 1 day and 3 weeks later.

Hedrick’s scripts were included in the present study to serve a related purpose – to provide children with a different experience of the same camping event, depending on whether they were exposed to elaborative or empty experimenter talk during the event, and to consider whether, in the presence or absence of a reminder, the experimenter’s conversational style at encoding would have a long-term effect on event recall.

Language Assessments. Children’s expressive and receptive language ability were assessed using two standardized measures: the Peabody Picture Vocabulary Test,

Third Edition (PPVT-III; Dunn & Dunn, 1997) and the Expressive Vocabulary Test (EVT; Williams, 1997). These measures were included in order to associate children's language ability with their recall. The PPVT and EVT are presented using stimulus picture books, which are standardized and were conormed on a sample of individuals aged 2.5 years through adulthood. Test validity and reliability for these measures were satisfactory, ranging from .91 to .94 and .77 to .90 for the PPVT and EVT respectively.

Hierarchical Memory Interview. Children's recall of the camping event was assessed twice during the study using a standardized protocol adapted from a body of research on children's recall of events (e.g. Ornstein, Larus, & Clubb, 1991; Haden et al., 2001). This memory interview, shown in Appendix G, was hierarchically structured, beginning with general, open-ended questions (e.g. "What did you do on your camping trip?") before asking specific open-ended questions (e.g. What all did you put in the backpacks?") and yes-no probes (e.g. "Did you have a lantern?"). The specific and yes-no questions were designed to inquire about features that were not spontaneously nominated by the child during more general prompts. Finally, in addition to features present during the camping adventure, the interview also included questions about features that were not present, to gage the accuracy of the children's responding.

Demographic Questionnaire. In order to learn general information about the sample, parents were asked to complete a brief questionnaire included in Appendix C, which posed questions about their child and their family. Specifically, one set of questions focuses on demographic information (e.g. gender, birth date, race, parental education, etc.). Additional items asked about the number of years the child has been in preschool and the child's overall development.

Procedure.

As depicted in Table 2 above, there were either three or four visits per child, depending on experimental condition. All of the visits of the study were conducted at the

five participating preschools, at scheduled times during the school day that were convenient for the preschool teachers. The assessments took place in areas designated for study use by preschool administrators, and were recorded on DVD for subsequent coding.

Visit 1: Language Assessments and Camping Event. During the first visit of the experiment, after the child has verbally assented to participate, the PPVT and EVT were administered using the standardized stimulus picture books. Because the measures were conormed together, such that the PPVT, the measure of receptive language, was always administered first, the same order of presentation was maintained in this study. During the PPVT, the experimenter showed the child four pictures at a time, said a word, and asked the child to point to the picture that best coincided with the target word. During the EVT, the measure of expressive language ability, the experimenter said a word to the child that described a picture, and the child was asked to provide a synonym for the target word/picture. The language assessments took approximately 20 minutes to administer.

Once each child's language ability was measured, she participated in the camping event with a different experimenter. Before the camping event began, the experimenter introduced herself, informed the child that they were going to go camping, and asked the child if she had ever been camping. The child's response to this yes/no question was used to approximate the child's prior experience with camping. Then, the experimenter and child entered an area where the camping materials were set up and began the camping event by packing various foods (e.g. hotdogs and hamburgers) and supplies (e.g. canteen and lantern) into backpacks. After packing these items, they followed a path to a pond and went fishing using a fishing pole and a net. When they finished fishing, the experimenter and child followed another path to a campsite. The campsite

had a grill, cooking utensils, and picnic setup (e.g. tablecloth, cups) that they used to cook and eat their food.

The items selected to be scripted as elaborative and empty talk were derived from an item analysis of features recalled by 36-month-olds in another previous study using the camping adventure (see Ornstein et al., 2004). As in Hedrick's (2006; Hedrick et al, in press) study, of the 16 of the 27 that were scripted, half of the scripted features were particularly salient to the children, as they were recalled by more than 50 percent of Ornstein et al.'s sample (i.e., backpack, fish, pond, fishing rod, net, marshmallows, drinks, and grill). The other eight scripted features were recalled by less than 10 percent of the children in Ornstein et al., 2004's sample (i.e., map, path, lantern, chicken, cheese, mustard, tongs, and tablecloth).

Regardless of elaborative or empty event condition, for each of the 16 scripted features, participants were asked to provide its label, and in the event that a child could not name the object, the experimenter provided its label. This was to ensure that at the time of encoding, the child was made aware of all of the feature labels. Then, the experimenter followed the elaborative or empty script, depending on the experimental condition to which the child was assigned. The remaining 11 features that were not scripted were not discussed, unless the child engaged those specific objects. In the rare case when a child attended to one of the 11 items that was not scripted, the experimenter would discuss each feature using a style of conversation that was consistent with the empty or elaborative script, depending on the experimental condition to which the child was assigned.

Given that the camping event was designed to be analogous to a real- word experience, in that the experimenter and child engaged in different steps of an event that has temporal constraints (i.e. the child cannot cook food at the campsite if he/she did not pack the food up at the beginning), there was a general order in which the experimenter

and child encountered the features, but no constraint on when each scripted feature would be discussed. Thus, as a general rule, the experimenter would follow the child's interest when initiating feature talk. For example, when a child directed his attention to a scripted feature that had not been discussed, the experimenter would deliver the first comment from the hierarchy of questions and statements about that feature and then continued to deliver the rest of the scripted feature talk. However, there were instances when a child did not initiate conversation about a scripted feature. In such cases, the experimenter would ask the child to label the feature and then the experimenter would deliver the scripted talk for that feature. Conversely, there were occasions when a child would preempt a scripted statement. In such cases, the experimenter positively evaluated the child's comment and then proceeded to the next scripted statement.

The camping event lasted an average of 12 minutes, 52 seconds (*SD* = 1 minute, 44 seconds) in the elaborative condition, and an average of 11 minutes, 23 seconds (*SD* = 1 minute, 33 seconds) in the empty condition. At the end of the event, each child was thanked for his or her participation, given stickers, and walked back to his or her classroom. The demographic questionnaire, a handwritten thank you note, and self-addressed stamped envelope were given to the child's teacher to be sent home with the child. Parents were asked to complete the background questionnaire and mail it to the lead experimenter of the study.

Visit 2: Immediate Interview. The day after the camping event (*M*= 1.51 days, *SD* = 1.18) an experimenter who was not present during the language measures and the event assessed children's recall using the hierarchical memory interview. Based on piloting for previous studies, it was found that young children had difficulty attending to and answering questions after having just participated in an interactive event. Thus, the immediate interview took place 1 day after the event. The interview lasted approximately 10-15 minutes, and was intended to be an index of children's immediate memory of the

event. After answering the general open-ended questions, specific open-ended questions, and yes-no questions about the camping event, each child was given stickers and escorted back to his or her preschool classroom.

Visit 3: Reminder. Four weeks after the camping event (*M* = 28.39 days, *SD* = 1.10), half of the children who took part in the elaborative event, and half of the children that took part in the empty event were selected at random (balanced by gender) to receive a brief reminder of the camping activity, as it was set up originally. An example of the setup is pictured in Figure 1.

Figure 1

Camping Event Setup

An experimenter who had not worked with the child previously, asked for the child's help in determining whether the experimenter had set up the features correctly. The reminder was introduced to the child as follows:

> "I want to set up the camping adventure just like my friend Priscilla does. But I've never set it up and I might get it wrong. Since you played with her, I'd like you to help me to make sure that the camping trip is set up right, just like it was when you went on the camping trip with Priscilla. Your job will be to look at the setup without talking about or touching the objects. Then, I will ask you about the setup."

The child was brought to the room where he or she experienced the camping event four weeks prior. It was set up exactly as it was during the original event (using pictures of the original event to guide setup). The children's exposure to the camping setup was timed, such that they were given 2 minutes to look at the objects. During the 2 minute reminder, any talking or touching of the objects was discouraged by the experimenter by saying, "Remember, your job right now is just to look at the objects." At the end of the 2 minutes, the experimenter asked the child the following yes/no question: "So, did I setup the camping trip right?" The child's answer and behavior during the reminder were noted and no further discussion was encouraged. Then, the child was given stickers and taken back to their classroom.

Visit 4: Final Memory Interview. Six weeks after the camping event (*M* = 48.29 days, *SD* = .95) each child was interviewed a final time about the camping event by an interviewer who was not present during any of the other visits. The final interview was identical to the hierarchical memory interview administered during Visit 2 and also took approximately 10-15 minutes to complete. At the end of the final visit, each child was given stickers, a book, and a small gift as a token of appreciation for their participation in the study. If the demographic questionnaire for that child had not been returned, a second copy was sent home to the family.

Coding and Scoring.

Each of the visits were recorded on DVD for subsequent coding and scoring. In addition, children's responses during the language assessments and reminder were recorded by pen and paper for scoring, though children's responses during the reminder were reconfirmed by watching the recording of the visit.

Language Assessments. Each child's raw language score was calculated using the protocol outlined by PPVT-III and EVT measures. Children's raw receptive and expressive language scores from these measures were transformed into standardized

scores based on the established age-related norms. The average of the standardized scores was then calculated to yield a total language score for each child.

Fidelity Checks. In order to ensure that the both the elaborative and empty event script was properly administered during the camping trip, all of the events were subjected to a fidelity check. Independent coders watched the recordings of each experimenter-child dyad engaging in the camping adventure while following along with the appropriate scripts, to ensure that the experimenter maintained the integrity of the script. Coders observed whether the experimenter engaged in scripted talk when presented with an opportunity, and whether she followed the statements outlined in the script without deviation. From this fidelity check, it was found that overall the experimenter adhered to the elaborative and empty event scripts, 99.62% (*SD* = 1.28%) and 99.66% (*SD* = .97%) of time, respectively. In addition, independent coders watched all of the event reminders from the recording and confirmed that they were all properly administered.

Immediate and Final Memory Interviews. Both the immediate and final memory interviews were scored and coded from the DVD recording of the session, using a scheme developed by Haden (1998; see Appendices H and I). For all of the interviews, the number of features recalled (e.g. *There was a backpack.*) as well as the number of unique elaborations were scored. Elaborations were defined as the statements that provided information about features above and beyond the feature label (e.g. *The backpack was green and we carried it with us*). This particular statement was scored as two elaborations about the backpack). The elaborations the child provided, however, were also general statements about the event that did not mention a specific feature (e.g. *We cooked all of the food*). Although this statement does not provide specific information about which food the child cooked, it does provide knowledge about actions that happened during the event.

In addition to whether a child recalls a feature or an elaboration, each child's recall during the immediate and final memory interviews was scored as to whether it was provided in response to an open-ended or specific yes/no question. For the present study, we will focus on only the open-ended responses the children provided, as children's open-ended responses provide detail as to what is being recalled and previous research has also only focused on this measure (e.g. Haden et. al, 2001; Hedrick et. al, in press; Hedrick, San Souci, Haden & Ornstein, in press). Thus, there are four dependent measures of children's overall remembering: feature recall in response to the open-ended questions immediately and six-weeks after the event, and elaborations in response to the open-ended questions immediately and six-weeks after the event. Children's feature recall at one day and at six weeks was further examined according to whether features were common or uncommon per Ornstein et al.'s (2004) analysis, whether they were scripted or unscripted, and whether they were features that were asked about, but not present during the event.

Reliability. Two coders independently coded 25% of the immediate and final memory interviews. Kappa statistics were calculated to determine the agreement between coders, and were found to be Kappa = .98 (*Range* = .89 - 1.00) for immediate feature recall, Kappa = .88 (*Range* = .80 - .96) for immediate elaborations, Kappa = .93 (*Range* = .64 - 1.00) for final feature recall, and Kappa = .87 (*Range* = .79 - .94) for final elaborations.

CHAPTER III: RESULTS

The results of this study are presented in three sections. First, preliminary analyses are presented, which include descriptive and correlational analyses among age, language, overall feature recall and event elaborations, and a test of retention in the entire sample over the six week delay. Second, the main results of the experiment are presented, considering feature recall and event elaborations during the immediate and final interviews for each of the conditions that resulted from the 2 x2 factorial design: event (elaborative or empty), reminder (present or absent), and event x reminder. In addition, difference as well as consistency in feature recall over the retention interval is examined. The third and final section offers more specificity about feature-level recall, namely analyses of recall of unscripted and scripted features, common and uncommon features, and recall of nonpresent features.

Preliminary Analyses.

There were two major questions of interest in this study: whether children's recall of the camping activity varied as a function of the experimenter's elaborative or empty talk during the camping event and in the presence or absence of a reminder four weeks after the event. However, before addressing this question, the means, standard deviations, and distributions for the PPVT, EVT, total language score, and the immediate and final memory interviews were examined. Overall, the distributions looked normal. An examination of the distributions to determine whether any individual's performance on any of the outcome measures was one standard deviation or more away from the next closest data point, did not detect any statistical outliers. As such, no participants were excluded from subsequent analyses.

Next, a series of Kruskal-Wallis tests were conducted to address whether there were any group differences in median gender, preschool site, preschool experience, maternal education, and previous camping experience. No systematic differences on these ancillary variables were observed, which was attributed to random group assignment (balanced by gender), and that the sample was recruited from several area preschools.

Descriptives. The means and standard deviations for age in months by condition are displayed in Table 3. Table 4 includes the means and standard deviations for the PPVT and EVT measures, as well as the total language scores. Table 5 and 6 show the means and standard deviations of children's feature recall during the immediate and final memory interviews, and the means and standard deviations of children's event elaborations during the immediate and final memory interviews.

Table 3

Mean Age by Condition

Condition	N	Age (months)
Elaborative event, reminder	17	50.76 (5.94)
Elaborative event, no reminder	16	54.38 (5.14)
Total elaborative event	*33*	*52.52 (5.78)*
Empty event, reminder	16	53.12 (4.16)
Empty event, no reminder	17	51.71 (4.47)
Total empty event	*33*	*52.39 (4.32)*
Total sample	66	52.45 (5.06)

As can be seen in Table 3, on average, children in the sample were 52.45 months of age, approximately 4 years, 4 months old. The mean age across condition did not differ much from the overall mean of the sample. There were no significant effect of event

(elaborative, empty), reminder (present, absent), or event x reminder: *Fs* (1, 63) ≤ 1.67, *p* ≥ .18.

Table 4

Means and Standard Deviations of the Language Measures by Condition.

Condition	N	PPVT raw score	EVT raw score	Total Language
Elaborative event, reminder	17	70.82 (12.88)	52.12 (12.89)	61.47 (11.82)
Elaborative event, no reminder	16	72.25 (20.07)	58.62 (11.79)	65.22 (15.31)
Total elaborative event	*33*	*71.52 (16.50)*	*55.27 (12.59)*	*63.29 (13.54)*
Empty event, reminder	16	74.94 (22.33)	57.50 (11.23)	66.22 (15.29)
Empty event, no reminder	17	73.35 (19.88)	54.88 (11.20)	64.12 (13.51)
Total empty event	*33*	*74.12 (20.78)*	*56.15 (11.12)*	*65.14 (14.21)*
Total sample	66	72.82 (18.66)	55.71 (11.79)	64.21 (13.81)

Overall, trends in PPVT and EVT performance were consistent across both measures and reflected in the total language ability summary score. As such, the total language score was used both descriptively and in subsequent analyses to reflect language ability. There were no significant effects of event, reminder, or event x reminder for the PPVT, EVT, or total language summary score [e.g. total language: *Fs* (1, 63) ≤ .50, *p* ≥ .48]. On a mean level, children in the empty event conditions had a slightly higher level of language ability, compared to children in the elaborative event conditions. The empty event, reminder condition had the highest level of language ability, though this group also had a large standard deviation, indicating wide variability in this group's language performance.

Table 5

Means and Standard Deviations of Feature Recall by Delay and Condition.

Condition	N	Immediate Recall (1 day)	Final Recall (6 weeks)
Elaborative event, reminder	17	9.88 (3.33)	8.47 (4.90)
Elaborative event, no reminder	16	9.56 (1.08)	9.81 (3.37)
Total elaborative event	*33*	*9.73 (3.80)*	*9.12 (4.22)*
Empty event, reminder	16	10.19 (4.26)	8.94 (4.20)
Empty event, no reminder	17	7.94 (3.93)	7.94 (2.66)
Total empty event	*33*	*9.03 (4.19)*	*8.42 (3.47)*
Total sample	66	9.38 (3.98)	8.77 (3.85)

On a mean level, it appears that children in the elaborative event have a slightly higher amount of feature recall during the immediate and final memory interviews. However, there is a discrepancy in the immediate performance of the empty event condition, such that the empty event, reminder condition recalls the most features at one day and the empty event, no reminder condition recalls the least number of features at one day. At six weeks, the elaborative event, no reminder condition recalls the most features, and the empty event, no reminder condition again recalls the least number of features. Further examination of Table 5 also shows that the reminder conditions have larger standard deviations than the no reminder conditions, indicating greater variability in performance. The main effects and interactive effects of the event and reminder condition on immediate and final feature recall are considered in the *Experimental Effects* section below.

Table 6

Means and Standard Deviations of Event Elaborations by Delay and Condition.

Condition	N	Immediate Recall (1 day)	Final Recall (6 weeks)
Elaborative event, reminder	17	38.71 (11.91)	34.18 (17.37)
Elaborative event, no reminder	16	41.62 (15.32)	40.69 (13.94)
Total elaborative event	*33*	*40.12 (13.53)*	*37.33 (15.90)*
Empty event, reminder	16	39.00 (17.41)	35.56 (16.22)
Empty event, no reminder	17	33.65 (10.97)	32.82 (9.21)
Total empty event	*33*	*36.24 (14.48)*	*34.15 (12.95)*
Total sample	66	38.18 (14.04)	35.74 (14.48)

The means and standard deviations for event elaborations reported during the immediate and final interview are slightly elevated for the elaborative event conditions as compared to the empty event conditions, with the elaborative event, no reminder condition showing the highest recall of event elaborations one day and six weeks after the event. The empty event, no reminder condition showed the lowest reporting of event elaborations during the immediate and final interviews. However, it is also important to note that, in general, there seems to be wide variability in performance, as indicated by the high standard deviations for the overall sample during both delays. The main and interactive effects of the event and reminder conditions on event elaborations are considered in the *Experimental Effects* section below.

Correlations. Although no group differences in language ability or age were found, coefficients were calculated to further examine associations between age and raw language ability, as well as their associations with feature recall during the immediate memory interview, feature recall during the delay memory interview, elaborations during

the immediate memory interview, and elaborations during the delay memory interview. The correlation matrix is displayed in Table 7.

Table 7

Pearson Correlations among Age, Language, and Memory Performance.

Variable	1	2	3	4	5	6
1. Age	-----	.52*	.32*	.35*	.58*	.52*
2. Total Language		-----	.43*	.42*	.50*	.56*
3. Immediate Feature Recall			-----	.80*	.64*	.65*
4. Immediate Event Elaborations				-----	.62*	.73*
5. Final Feature Recall					-----	.81*
6. Final Event Elaborations						-----

Note: * p<.01

As can be seen in Table 7, all of the memory measures were intercorrelated, as expected. Children's language ability and age were also correlated with the feature recall and elaborations reported during the immediate and final interviews. Overall, these correlations indicate positive interrelations among age, language and memory reporting, such that the older and more verbal children recalled more information during the memory interviews. As a result, when testing memory performance in the entire sample as well as the main experimental effects using an ANOVA framework, language and age were identified as potential covariates. However, because age and total language score (which was calculated from children's raw PPVT and EVT scores) were correlated, which indicates a co-linear relation between these two variables, only one measure, age, was used as a covariate. This decision was made in order to preserve degrees of freedom and because age as a covariate in theory controls for maturation, which should encompass some aspects of language ability, as well as memory capacity. Thus, age was included as a covariate in the subsequent ANCOVAs.

Overall Memory Performance. Before analyzing between group differences, two repeated measure ANCOVAs were calculated to determine whether there were significant differences in feature recall and event elaborations over the six weeks, regardless of treatment. Because six weeks had passed between the immediate and final interviews, some forgetting by the overall sample was expected. The overall tests of forgetting of features (*Ms* = 9.38, 8.77) and elaborations (*Ms* = 38.18, 35.74) across the immediate and final interviews were significant: F (1, 63) = 6.17, $p < .05$ and F (1, 63) = 5.04, $p < .05$, respectively, indicating that some forgetting of features and elaborations had occurred across all of the children in the sample.

Experimental Effects.

Immediate Memory Interview. Given the 2 x 2 factorial design of the experiment, it was necessary to first examine whether performance during the immediate interview differed depending on if children experienced elaborative or empty talk during the event, and moreover, whether there was a significant effect of event x reminder on the immediate interview, even though this was before the children were or were not exposed to the reminder. Tables 5 and 6 display the means for feature recall and event elaborations at the 1-day delay interview, by event and event x reminder. No significant differences on either of these factors were found, Fs (1, 63) ≤ 1.34, $p \geq .25$, meaning that children in the elaborative and empty event conditions reported a similar amount of features and event elaborations in the immediate interview.

Because these tests determined that the empty and elaborative event scripts did not lead to significant differences in children's immediate recall, it was also necessary to determine if during the immediate interview, the children who received a reminder differed from children who did not receive a reminder, though this additional treatment was not administered until four weeks later. Mean immediate feature recall and event elaborations for children who received a reminder were 10.03 (*SD* = 3.75) and 38.85 (*SD*

= 14.59), respectively. In comparison, children who did not receive a reminder four weeks after the event reported 8.73 (*SD* = 4.16) features and 37.52 (*SD* = 13.66) event elaborations. No significant differences among immediate feature recall and event elaborations based on reminder were found: *Fs* (1, 63) ≤ 2.97, *p* ≥ .09, which showed that children who received the reminder at four weeks did not differ in reporting during the first memory interview. In addition, there was no effect of event x reminder for either immediate feature recall or event elaborations: *Fs* (1, 63) ≤ .26, *p* ≥ .61.

Final Memory Interview. Children's performance during the final memory interview was analyzed in the same fashion as children's immediate performance, through a series of univariate ANCOVAs, considering main and interactive effects of treatment on final memory performance. Children's mean feature recall and event elaborations at six weeks are also displayed in Tables 5 and 6. No significant differences in children's final feature recall and reporting of event elaborations were found by event at six weeks, *Fs* (1, 63) ≤ .96, *p* ≥ .33. The major tests of interest, however, concerned whether there was an event x reminder effect for the recall of features and event elaborations at six weeks. There was no significant effect of event x reminder on feature recall and event elaborations reported during the final memory interview, *Fs* (1, 63) ≤ .09, *p* ≥ .77. An inspection of performance on the final memory interview depending on whether a reminder was administered showed that mean feature recall and event elaborations were slightly elevated for children who did not receive a reminder. Children who did not receive a reminder recalled an average of 8.85 (*SD* = 3.12) features and 36.64 (*SD* = 12.23) event elaborations, as compared to 8.70 (*SD* = 4.51) features and 34.85 (*SD* = 16.58) event elaborations by children who received a reminder at four weeks, though this difference in final memory performance between the reminder conditions was nonsignificant: *Fs* (1, 63) ≤ .18, *p* ≥ .68.

Cumulatively, these findings indicate that the encoding manipulation, the reminder, and the combined encoding and reminding manipulations were not successful. There were no significant differences in immediate and final memory performance based on condition, though there was some forgetting in both feature recall and event elaborations in the entire sample over the six week delay interval, as determined by the repeated measure ANCOVA reported above. Given that this forgetting in the entire sample was not accounted for when examining overall feature recall and event elaborations at each delay interval, and that there was wide variability in memory performance across conditions (highlighted by the large standard deviations for each of the outcome measures), additional analyses focused on difference scores between immediate and final feature recall to determine whether there were group differences in loss or gain over the six week delay. Consistency in feature recall over the retention interval was also examined.

Difference and Consistency in Feature Recall. In order to consider the influence of condition on the loss and gain of features between immediate and final feature recall, difference scores were calculated by subtracting 6-week feature recall from 1-day feature recall. The mean difference score for features by condition are shown in Table 8. A positive score indicates forgetting across the six week retention interval.

Table 8

Mean Difference Score for Features by Condition.

Condition	N	Difference Score for Features
Elaborative event, reminder	17	1.41 (3.34)
Elaborative event, no reminder	16	-.25 (3.13)
Total elaborative event	*33*	*.61 (3.30)*
Empty event, reminder	16	1.25 (3.44)
Empty event, no reminder	17	0 (3.41)
Total empty event	*33*	*.61 (3.43)*
Total sample	66	.61 (3.34)

Note: Difference scores were calculated by subtracting final feature recall from immediate feature recall. A positive score indicates forgetting over the six week retention interval.

Upon examining the mean difference scores for condition by features, it appears that the no reminder conditions did not experience forgetting over the six weeks. Moreover, the elaborative event, no reminder condition experienced slight gain during the retention interval. In contrast, those in the reminder conditions lost, on average, at least one feature from the immediate to final memory interview. Overall, mean forgetting for the elaborative and empty event conditions were equivalent, which indicates that the entire sample, on average, forgot a little less than one feature over the retention interval. Univariate ANCOVAs were estimated to assess whether there were any significant effects of event and reminder on forgetting (M = 1.33, SD = 3.33 and M = -.12, SD = 3.23, for the reminder and no reminder conditions respectively). There were no significant effects of event, reminder, and event x reminder [Fs (1, 63) ≤ .01, p ≥ .96 for the encoding and reminder manipulations; Fs (1, 63) = .09, p = .77 for the interaction].

To consider consistency in recall from one day to six weeks after the camping event, a proportion score was calculated by dividing the number of features that were recalled during both the immediate and final memory interviews by the total number of features recalled during the immediate interview. The mean proportion of consistent feature recalled by condition is displayed in Table 9.

Table 9

Mean Proportion of Consistent Feature Recall by Condition.

Condition	N	Consistent Feature Recall
Elaborative event, reminder	17	.75 (.30)
Elaborative event, no reminder	16	.89 (.16)
Total elaborative event	*33*	*.82 (.25)*
Empty event, reminder	16	.80 (.25)
Empty event, no reminder	17	.87 (.18)
Total empty event	*33*	*.84 (.22)*
Total sample	66	.83 (.23)

Note: Proportion scores for consistency were calculated by dividing the number of features that were recalled during both the immediate and final memory interviews by the total number of features recalled during the immediate interview.

Overall, recall was very consistent during the retention interval, as on average, 83% of the features recalled during the initial interview were also recalled during the final interview. However, mean consistency in the empty event and no reminder conditions was slightly elevated, though there were no significant differences in feature recall consistency across the six week delay by event or reminder, Fs (1, 63) ≤ 3.06, p ≥ .09, or event x reminder, Fs (1, 63) = .01, p = .97

Specific Feature Recall.

Although there were no differences in gain, loss, and consistency in feature recall across the retention interval, feature recall during the immediate and final interviews was examined on five additional dimensions: unscripted features, scripted features, common features, uncommon features, and nonpresent features.

Recall of Unscripted and Scripted Features. The empty and elaborative talk scripts included questions and statements about the same subset of features from the camping event. The 16 of the 27 features that were scripted included the map, backpack, path, lantern, fish, pond, fishing rod, net, chicken, cheese, marshmallows, mustard, tongs, drinks, tablecloth, and grill. The remaining 11 features: hamburgers, hotdogs, buns, lettuce, tomatoes, potato chips, frying pan, pot, plates, cups, and napkins, were not scripted, and thus, were not discussed by the experimenter during the camping event. Because there were more scripted than unscripted features, proportion scores for these outcome measures were created for each participant's immediate and final recall by dividing number of unscripted and scripted features reported by the total number of these features, 11 and 16 respectively. The mean proportion of unscripted features recalled by delay and condition is presented in Table 10 below.

Table 10

Mean Proportion of Unscripted Feature Recall by Delay and Condition.

Condition	N	Immediate Recall (1 day)	Final Recall (6 weeks)
Elaborative event, reminder	17	.25 (.16)	.18 (.18)
Elaborative event, no reminder	16	.24 (.18)	.21 (.15)
Total elaborative event	*33*	*.25 (.16)*	*.20 (.17)*
Empty event, reminder	16	.24 (.17)	.17 (.13)
Empty event, no reminder	17	.16 (.14)	.16 (.14)
Total empty event	*33*	*.20 (.16)*	*.17 (.13)*
Total sample	66	.22 (.16)	.18 (.15)

Note: Proportion scores for unscripted features were calculated by dividing the number of unscripted features that were recalled during both the immediate and final memory interviews by 11, the total number of unscripted features.

During the immediate interview, 22% of the unscripted features were recalled by the total sample, though both the elaborative event conditions as well as the empty event reminder condition recalled nearly 25% of the unscripted features. The empty event, no reminder condition, in contrast, recalled only 16% of the unscripted features. During the final interview the number of unscripted features recalled by the total sample dropped to 18%, with children in the elaborative event conditions reporting slightly more of these features than those in the empty event conditions. Recall of unscripted features for children in the reminder only condition was also slightly higher than overall mean recall. Children who received a reminder recalled 25% (*SD* = 16%) of the unscripted features and those that did not receive a reminder recalled 20% (*SD* = 16%) of the unscripted features during the immediate interview. In the final interview, children in the reminder condition recalled 19% (*SD* = 14%), and children in the no reminder condition recalled 18% (*SD* = 16%) of the unscripted features. A repeated measure ANCOVA was used to

evaluate the drop in unscripted feature recall from the immediate to final interview in the total sample, and rendered the difference to be nonsignificant: F (1, 63) = 1.15, p = .29. In addition, a series of univariate ANCOVAs were calculated to determine if there were any significant effects of event and reminder in the reporting of unscripted features one day or six weeks after the event. None of these tests were significant [Fs (1, 63) ≤ 2.33, p ≥ .13, for the immediate interview; Fs (1, 63) ≤ .80, p ≥ .37 for the final interview]. In addition, there were no significant effect of event x reminder: Fs (1, 63) ≤ .33, p ≥ .57.

Table 11 presents the mean proportion of scripted feature recall by delay and condition.

Table 11

Mean Proportion of Scripted Feature Recall by Delay and Condition.

Condition	N	Immediate Recall (1 day)	Final Recall (6 weeks)
Elaborative event, reminder	17	.44 (.15)	.40 (.20)
Elaborative event, no reminder	16	.43 (.17)	.47 (.13)
Total elaborative event	*33*	*.44 (.15)*	*.44 (.17)*
Empty event, reminder	16	.47 (.18)	.44 (.18)
Empty event, no reminder	17	.39 (.18)	.39 (.11)
Total empty event	*33*	*.43 (.19)*	*.41 (.15)*
Total sample	66	.43 (.17)	.42 (.16)

Note: Proportion scores for scripted features were calculated by dividing the number of scripted features that were recalled during both the immediate and final memory interviews by 16, the total number of scripted features.

Upon comparing Tables 10 and 11, it is clear that overall, children recalled more of the scripted versus nonscripted features. Among children's recall of scripted features, there was also far less variability across conditions, with the total sample recalling 43% of the scripted features during the immediate interview and 42% of the scripted features

in the final interview. A repeated measure ANCOVA was used to evaluate whether there were differences in scripted feature recall across the retention interval, and found that total sample recalled significantly more scripted features one day after the event: F (1, 63) = 6.68, $p < .05$. However, given that the difference between the immediate and final interview is .01, and that when age is not used as a covariate, this difference is not significant, is it not clear what this difference means. Moreover, there was no significant effect of reminder on scripted feature recall: M = 46% (SD = 16%) and M = 42% (SD = 19%), for the children who received a reminder during the immediate and final interviews, and M = 41% (SD = 17%) and M = 43% (SD = 13%) for the children who did not receive a reminder during the immediate and final memory interviews, *[Fs* (1, 63) ≤ 2.24, $p \geq .14$ for recall of scripted features among the reminder condition during immediate and final recall]. Thus, the small mean difference in scripted feature recall over the retention interval seems to be due to general decay, as there was not a significant effect of event or reminder on scripted feature recall for the immediate or final interview: *Fs* (1, 63) ≤ .37, $p \geq .54$. In addition, there was no effect of event or event x reminder on children's feature recall during the immediate and final memory interviews: *Fs* (1, 63) ≤ .24, $p \geq .63$.

Recall of Common and Uncommon Features. In order to further explore differences in scripted feature recall, an additional series of analyses focused on subsets of the scripted features, namely common and uncommon features. The 16 features that were scripted were derived from an item analysis of features recalled by 36-month-olds in a previous study using the camping event (see Ornstein et al., 2004). In the previous study, eight of the scripted features were particularly salient to the children, as they were recalled by more than 50 percent of the sample in Ornstein et al. (2004) (i.e., backpack, fish, pond, fishing rod, net, marshmallows, drinks, and grill). The other eight scripted features were recalled by less than 10 percent of the Ornstein et al. (2004) sample (i.e.,

map, path, lantern, chicken, cheese, mustard, tongs, and tablecloth). The salient items from the previous investigation are considered *common features* in the camping event, whereas the features recalled by less than 10 percent of the sample are considered *uncommon features*. Table 12 shows the mean number of common features recalled by this sample, by delay and condition.

Table 12

Mean Number of Common Features Recall by Delay and Condition.

Condition	N	Immediate Recall (1 day)	Final Recall (6 weeks)
Elaborative event, reminder	17	5.24 (1.20)	4.76 (1.99)
Elaborative event, no reminder	16	4.81 (1.56)	5.31 (1.49)
Total elaborative event	*33*	*5.03 (1.38)*	*5.03 (1.76)*
Empty event, reminder	16	5.31 (1.99)	5.50 (1.90)
Empty event, no reminder	17	4.41 (1.73)	4.76 (1.30)
Total empty event	*33*	*4.85 (1.89)*	*5.12 (1.64)*
Total sample	66	4.94 (1.64)	5.08 (1.69)

Overall, the total sample experienced a slight elevation in common feature recall across the retention interval. A repeated measure ANCOVA confirmed that this increase in common feature recall was significant: F (1, 63) = 11.07, $p < .01$. As can be seen in Table 12, the empty event, reminder condition recalled the greatest number of common features during the immediate interview and final interviews. In addition, feature recall among the elaborative event conditions was consistent over the delay, but for the empty event condition, as well as the reminder condition for each event, there was a gain in the number of common features recalled over the delay. The reminder condition recalled an average of 5.27 (SD = 1.61) common features one day after the event, and an average

of 5.12 (*SD* = 1.95) common features six weeks after the event. The no reminder condition recalled 4.61 (*SD* = 1.64) common features one day after the event, and an average of 5.03 (*SD* = 1.40) common features six weeks after the event. Yet, there were no significant effects of event and reminder on common feature recall, nor was there a significant effect of event x reminder on children's recall of common features during the immediate and final memory interviews [*Fs* (1, 63) ≤ 3.35, *p* ≥ .07 for the immediate interview; *Fs* (1, 63) ≤ .60, *p* ≥ .44 for the final interview].

Table 13

Mean Number of Uncommon Feature Recall by Delay and Condition.

Condition	N	Immediate Recall (1 day)	Final Recall (6 weeks)
Elaborative event, reminder	17	1.88 (1.93)	1.71 (1.49)
Elaborative event, no reminder	16	2.06 (1.39)	2.19 (1.11)
Total elaborative event	*33*	*1.97 (1.67)*	*1.94 (1.32)*
Empty event, reminder	16	2.25 (1.29)	1.56 (1.41)
Empty event, no reminder	17	1.76 (1.35)	1.41 (.87)
Total empty event	*33*	*2.00 (1.32)*	*1.48 (1.15)*
Total sample	66	1.98 (1.49)	1.71 (1.25)

Table 13 shows the mean number of uncommon features recalled by each condition during the immediate and final memory interviews. Upon comparing Tables 12 and 13, it is clear that children recalled more common than uncommon features across conditions. Children's recall of uncommon features was low, with the total sample recalling an average of a little less than two uncommon features during the 1-day and 6-week interviews, and there was no significant difference in the uncommon feature recall of the total sample across the retention interval: *F* (1, 63) = .38, *p* = .54. This was likely due to

the low report of uncommon features and wide standard deviations in uncommon feature recall at both delays. Recall of uncommon features among the reminder condition was also low, with children who received a reminder reporting an average of 2.06 (*SD* = 1.64) and 1.94 (*SD* = 1.32) for the immediate and final interviews, respectively. The no reminder condition reported an average of 1.91 (*SD* = 1.36) and 1.79 (*SD* = 1.05) uncommon features during the immediate and final interviews, respectively. As such, there were no significant effects of event and reminder, nor was there a significant effect of event x reminder on children's uncommon feature recall: [*Fs* (1, 63) ≤ .46, *p* ≥ .80 for the immediate interview; *Fs* (1, 63) ≤ 2.54, *p* ≥ .12 for the final interview].

Recall of Nonpresent Features. A final series of analyses concerned whether there were any differences across delay and by condition in the recall of features that were not present during the camping event. The seven nonpresent features about which the children were asked were: animals, sharks, boats, macaroni, pizza, ketchup and tent. These features were categorically-consistent with features present during the camping event (e.g. food), and were included in the interview to gauge children's overall accuracy in reporting. Mean nonpresent feature recall by delay and condition is displayed in Table 14 below.

Table 14

Mean Number of Nonpresent Feature Recall by Delay and Condition.

Condition	N	Immediate Recall (1 day)	Final Recall (6 weeks)
Elaborative event, reminder	17	.18 (.39)	.18 (.39)
Elaborative event, no reminder	16	.06 (.25)	.19 (.54)
Total elaborative event	*33*	*.12 (.33)*	*.18 (.47)*
Empty event, reminder	16	.31 (.48)	.38 (.81)
Empty event, no reminder	17	0 (0)	.12 (.33)
Total empty event	*33*	*.15 (.36)*	*.24 (.61)*
Total sample	66	.14 (.35)	.21 (.54)

As can be seen in Table 14, the recall of nonpresent features occurred very infrequently, as the entire sample reported, on average, less than one nonpresent feature during both the immediate and final memory interviews. A repeated measures ANCOVA of nonpresent features indicated that there was no significant difference across the retention interval for the entire sample, F (1, 63) = .02, p = .89. However, during the immediate interview there was a significant difference in the reporting of nonpresent features for the reminder condition, such that the children who did not receive a reminder reported fewer nonpresent features, M = .03 (SD = .17), than the children who received the reminder condition, M = .24 (SD = .44); F (1, 63) = 7.40, p < .01. Yet, there was no significant effect of event x reminder on children's reporting nonpresent features during the immediate interview: F (1, 63) = .90, p = .35. Finally, during the six week interview, there was a slight increase in nonfeature recall, but there were no significant effects of event, reminder, or event x reminder, Fs (1, 63) ≤ .91, p ≥ .35.

Summary.

Across the entire sample, there was significant forgetting among feature recall and elaborations during the retention interval, and a series of ANCOVAs were performed to determine whether there were any effects of event (elaborative or empty), reminder (present or absent), or event x reminder. Additional ANCOVAs were also carried out to determine whether forgetting could be attributed to specific subgroups of features. Cumulatively, it was found that there were no differences in reporting during the immediate and final memory interviews due to treatment.

In addition, difference and consistency scores for feature recall were calculated, and no significant effects of event, reminder, or event x reminder were found in these measures of gain, loss, and maintenance across the retention interval. Five subtypes of feature recall were also examined: recall of unscripted and scripted features, common and uncommon features, and recall of nonpresent features. The subtypes focused on the reporting of features only, as opposed to feature elaborations, due to issues of scale (e.g. proportion scores were calculated to ease in comparison between subtypes) and scope, as the findings for feature reporting were equivalent to those for event elaborations. As with the other outcome measures, there were no significant effects of event, reminder, and event x reminder in reporting among the five feature subtypes, with the exception of a significant difference in nonpresent feature recall during the immediate interview among those in the reminder condition, though there was no effect of event x reminder on children's reporting of nonpresent features. Thus, the elevation in recall of nonpresent feature seems arbitrary, as on average, these children recalled less than one of the seven nonpresent features. In sum, the experimental manipulations did not affect memory performance.

CHAPTER IV: DISCUSSION

The present experiment was designed to examine the effects of encoding and reminding on preschoolers' long-term event memory. Elaborative and empty styles of conversation were used by an experimenter during a pretend camping event. The effects of these different conversational styles as well as the presence or absence of a reminder of the original camping set up were evaluated, and it was found that the treatments did not significantly affect memory performance one day or six weeks after the event. Upon examining the means across the dependent measures, it is important to note that there were, in general, large standard deviations for the conditions, indicating wide variability in children's performance on the task. During the immediate interview, specifically, the group with the largest amount of variability was the empty event, reminder condition which, though the reminder was not administered until 4 weeks later, had higher mean recall of both features and event elaborations than the empty event, no reminder condition. However, this difference was not significant.

There are several factors that may have contributed to the null effects that were observed in this study, including the encoding experience, the type of reminder, the timing of the reminder, and the length of the retention interval. These aspects of the study are discussed in terms of previous event-child and parent-child reminiscing studies, as well as reinstatement. Future directions consider the importance of mapping the forgetting and retention functions of the camping event in order to more precisely apply reinstatement theory to studies of long-term recall of this experience.

Elaborative and Empty Encoding Experience.

An important aspect of the project was the examination of the impact of different ways in which the same camping experience might be encoded – given different styles of experimenter talk to which the children were exposed – on children's memory for the event one day and six weeks afterwards. In many ways, the type of talk the children experienced in the two encoding conditions differed dramatically, as those in the elaborative talk condition were guided through the camping event by an experimenter who used a variety of open-ended questions to encourage children's verbal contributions, as well as associations to link the ongoing activity with other experiences the child may have had, and evaluations that affirmed the child's contributions to the event. In contrast, in the empty event condition, opportunities for the child to contribute to the conversation by responding to open-ended questions were not offered, and associations and confirmations were not provided by the experimenter. The difference between the elaborative and empty talk conditions is highlighted by examining the scripted statements for the fishing rod in each condition:

> *Elaborative:* "What is this? *(child responds)* That's right! Do you know how this fishing rod works? What can you do with this fishing rod? The end of the line has a magnet to put in the fish's mouth. You wind the reel to pull the fish up.
>
> *Empty:* "What is this? *(child responds)* Cool. Do you want to hold this? Can I use it now? This is neat. I like fishing."

As can be seen above, the number of statements relating to the fishing rod are held constant across the elaborative and empty talk scripts; however, the scripted statements in the elaborative condition not only offer more information about the feature, but more enriched opportunities for the child to verbally engage in the event. Nevertheless, these differences ultimately did not affect recall. Even though the scripts were designed based on previous research (McGuigan & Salmon, 2006), and used in a previous study that demonstrated an encoding effect (Hedrick; 2006; Hedrick et al., in press), in the present

experiment, there were no significant differences in memory performance among children who had received the empty and elaborative talk scripts. Yet, it is likely that the null effects in the present study are due to the wide variability in performance among conditions. The large age range of participants (3.5 to 5 years of age), is a main source of this variability, as age was positively correlated with feature recall and event elaborations during the immediate and final memory interviews (*r*s =.32 and .35 for the immediate interview and .58 and .52 for the final interview, *p*s > .01). Notably, the correlations among age and the memory measures is a significant departure from Hedrick (2006) and Hedrick et al., (in press), as in their investigation, using the empty and elaborative camping scripts with children of the same age range and overall mean age, age and memory performance were not correlated.

The present study was based on a socio-communicative perspective of memory development, which suggests that elaborative conversational exchanges lead to enhanced long-term recall of an event (e.g. Ornstein & Haden, 2002; Reese et al., 1993). It is suspected that within an elaborative conversation, the more skilled partner is scaffolding joint attention and communication, which leads to enhanced understanding of a novel situation, thereby positively affecting the encoding and subsequent recall of the event (Ornstein et al., 2004). However, this theory is based on parent-child, not experimenter-child, interaction. Although the scripts were modeled after high- and low-elaborative conversation styles that mothers naturally exhibit and that have been widely documented in the literature (see Fivush et al., 2006 for a review) in the present study, an experimenter who the child had met for the first time participated with him or her in the event. Regardless of condition, given that the mean age of the children was approximately 4 years, 4 months, it is likely that the countless interactions that they have with their parents and other skilled conversation partners have prepared them with ways to navigate novel events. The contribution of the more static styles of conversation the

child experiences in the home and the school, in combination with the talk assigned to the child at the time of encoding, is necessary to consider in future research. It may be that children, who have more experience with a high-elaborative style of conversation in their daily lives, may be better able to negotiate the empty talk condition than those that do not.

Type of Reminder.

In the present study, half of the children were selected to receive a reminder of the setup camping event during the retention interval. During the reminder, the children were instructed to look at the objects for two minutes, without talking about them or touching them. This reminder was modeled after a previous study of reinstatement in 5- and 7-year-olds carried out by Priestley and her colleagues (1999), and even though it served to reduce forgetting in that investigation, it did not have an effect on children's recall in the present study. Although a reminder of the set up objects is consistent with Priestley et al. (1999), a different type of reminder may be more ideal for the camping event. In instances like the camping event and other events, in which a number of stimulus cues are present and a rich representation has been encoded, it is likely that the ideal reminder would depend on personal experience, as what is attended to during the event would vary across individuals. We can also draw from the information-processing perspective to discern what would be an effective reminder. Tulving's *encoding specificity hypothesis* states that the most optimal retrieval cues are those that are associated with or embedded in the to-be-remembered item as they were encoded (e.g. Thomson & Tulving, 1970). In applying this to reinstatement, then, an optimal reminder would be present during the event and the reminder. Though our reminder in some ways satisfies this criterion in that during the reminder, the children viewed objects from the original event, during the original event, these objects were presented in the presence of experimenter talk, and the child was able to freely manipulate the objects. During the

reminder, however, children were asked to passively view the objects without talking about or touching them.

Ideally, a rich encoding experience would offer the greatest opportunity for linkages to be made between stimuli and potential reminders. The idea that a reminder should be similar to what is present at the time of encoding in order to "jog" a representation, in the present study, might suggest that the reminder of the set up objects was not similar enough to the original encoding event. Thus, although the objects were the same as what was used in the original event, it may be that the reminder was not as salient because it was devoid of interaction that occurred in the original event. A more effective reminder might include more verbal or action cues, either live or perhaps in the form of videotape. A videotaped reminder might have been an especially potent reminder as it would have shown the children how they originally interacted with the objects. In observing their original interactions, this may have provided an opportunity for the children to reexperience salient aspects of the event.

Timing of Reminder.

In the present study, half of the children were selected to receive a reminder four weeks after the event, and two weeks before final test. The motivation for this timing was based on Rovee-Collier's *time windows hypothesis*, which suggests that retrieval of an event late in the time window of forgetting has a greater facilitative effect on remembering than retrieval of an event early in the time window (Rovee-Collier, Greco-Vigorito, & Hayne, 1993). In other words, it is hypothesized that a reminder should occur close to the end of the retention interval, after some forgetting has occurred but not before the trace is lost, so that the reinstatement stimulus can reactivate the weakened memory trace, and thereby increases its accessibility for later reporting. However, we know that the greatest drop in forgetting occurs relatively early in a retention interval. Thus, it is likely that children's initial drop in remembering may have occurred during the

first day after the experience. Perhaps then, if the immediate memory interview had taken place only minutes after the event rather than 1 day later, we would have been better able to capture forgetting, as regardless of condition, there was very little forgetting across the 6 week delay. Moreover, because the camping event has only been used in a few studies, the forgetting and retention functions for the tasks are currently unknown, though given the lack of forgetting that occurred over the six week delay, it seems that both the reinstatement and final interview were administered too soon.

Length of the Retention Interval.

Memory was assessed one day and six weeks after the camping event. These delays were selected based on previous research using the camping event. In previous studies using the camping event, recall is typically assessed after three weeks. The present study extended the retention interval to six weeks, as it was suspected that children would show increased forgetting over this longer delay. This, in combination with the fact that the immediate interview took place one day after the event, because previous piloting had found it difficult to administer the memory interview to children immediately after the event, may have lead to our inability to capture children's forgetting of the event. In future studies, the possibility of the immediate interview taking place just a few minutes after the event should be explored, as well as a more protracted test of long-term recall. This would require an exploration of the natural retention function of the task, absent of a reminder, in order to determine the optimal delay interval that would allow for the greatest amount of forgetting to be captured.

Future Directions.

Although the present experiment did not successfully manipulate children's reporting of the camping event, much has been learned from the investigation. Given that only a few studies have utilized experimenter talk scripts modeled after styles of mother-child reminiscing, future research should focus on the efficacy of these scripts

and whether additional open-ended questions, associations, and evaluations should be added. Specifically, only 16 of the 27 features in the event were scripted; perhaps the remaining features should also be scripted, in order to increase the participant's exposure to the elaborative and empty conversation styles. Though the experimenter maintained the integrity of the scripted statements more than 99% of the time, scripting the entire event would allow for the consistency of talk to be examined for the entire event, and may strengthen the overall manipulation.

The type of reminder for the camping event should also be evaluated. Despite that only a few studies of reinstatement of children's event memory have been conducted, there are a number of reminders that can be explored. The selection of a reminder can be informed by an examination of the retrieval cues that are most effective, such that the most effective reminders might be similar to the cues that are part of the original experience, or those that accurately capture parts of the original experience. Given the interaction that took place during the camping event, it also seems that an effective reminder would involve the child's participation. Possible reminders include: partial reenactment as well as viewing the set up of the objects, or a videotape of the child's original experience, with verbal interaction between the experimenter-child dyad.

The timing of the reminder is also important to consider in future research. However, it is difficult to know when would be the most effective point in the retention interval to intervene without knowledge of the forgetting and retention function of the camping event. Thus, before conducting additional studies of reinstatement with this task, it is necessary to first investigate long-term of the camping activity in different groups of children with a specific age cohort (e.g. 4 years), with the earliest test of long-term recall occurring at six weeks, and additional assessments being made after delays of 12, 18, 24 weeks, et cetera, until a substantial decrement in recall is observed. Then, future

studies of reinstatement could target when during the retention interval a reminder would be most effective in facilitating long-term recall.

There are several applied implications that make it necessary to further study reinstatement of event memory. Broadly speaking, we encounter many reminders in our daily lives that facilitate long-term remembering. For example, talking with others about a past experience or viewing photographs of the event, can serve to extend the period of encoding for an event, and enhance our remembering of a past experience in the service of recall at a later date. However, the efficacy of these reminders would depend on the strength of the original trace. Although the present study did not find an effect when manipulating encoding and reminding of a camping event across a 6 week delay interval, studies of reinstatement are not for naught. Given that children, like adults, are asked to provide information about their past experiences on a daily basis, as well as in high stake situations (such as when they are called upon as eyewitnesses), it is necessary to understand how reminders presented during a delay interval can facilitate recall. Moreover, because it is hypothesized that reminders presented during childhood can serve to preserve memory traces that would typically be forgotten, thereby creating an enduring link between early and later behavior across development (Campbell & Jaynes, 1966), future research that explores how age, in combination with the timing and type of a reminder for a specific task is needed to understand how reminders can support long-term recall.

APPENDIX A: PARENT INVITATION LETTER

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
CHILDREN'S MEMORY STUDY

Priscilla San Souci
Doctoral Candidate
Tel:
email:

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College of Arts and Sciences
CB # 3270 Davie Hall
Chapel Hill, NC 27599

January, 2008

Dear Parents,

I am conducting a research project examining preschoolers' event memory in order to fulfill the requirements for obtaining my Ph.D. in Developmental Psychology from the University of North Carolina at Chapel Hill. This project is supervised by my advisor, Dr. Peter A. Ornstein, Professor of Psychology. I greatly appreciate you taking the time to read this letter to determine if you would permit your child to participate in this project. *Name of preschool director* of *name of preschool* have graciously granted me access to space in the school so that all assessments involved in this project will take place during the school day. Should you allow your child to participate, your child will be seen on four separate occasions and will be taken out of his/her classroom at a time that is convenient for your child's teacher.

The focus of the project involves each child participating in a structured "camping adventure" with a highly-trained researcher. The event includes a variety of materials, such as food and backpacks to pack up for the adventure, a fishing pond, and a campsite complete with a grill to cook the food. We have conducted several studies of children's event memory using this camping adventure and have found that this event is very enjoyable for children. The camping event will be recorded and will take approximately 20 minutes. Either before or after this event, we will also administer two widely used, standardized measures of language skill that ask children to say words or point to pictures. These language measures will also take about 20 minutes to complete.

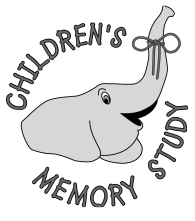
Each child's memory for the camping event will be assessed twice by two different, highly-trained researchers. These memory interviews will take about 20 minutes to complete, and will take place one day and six weeks after the adventure. Some of the children will also be chosen at random to receive a brief reminder of the event before the final memory interview, and we will be sending home a brief questionnaire for you to complete about your child.

Your child's participation in this study will enable us to learn more about how conversations as events unfold impact preschoolers' memory. Indeed, although each child will experience the event with an experimenter, this study has implications for how parents can best structure conversations to facilitate children's remembering. As such, we would greatly appreciate your participation. Moreover, because this research could not happen without you and your child's support, each child will be given a small gift and a book as a token of appreciation for his/her participation, and upon completion of the study, we will share with you our overall findings in a brief report.

If this project sounds like it would be of interest to you and your child, please read the enclosed informed consent forms and return one signed copy using the provided self-addressed stamped envelope. As emphasized in the form, participation is completely voluntary and if your child would like to cease participating at any time during any of the sessions, s/he may do so. It is also important that you know that any information you share with us and that we gather through working with your child will be kept in the strictest confidence.

If you have any questions, please feel free to contact me at any time. Thank you again for your time and consideration.

Sincerely yours,



Priscilla San Souci

APPENDIX B: CONSENT FORM

University of North Carolina-Chapel Hill
Parental Permission for a Minor Child to Participate in a Research Study
Social Behavioral Form

IRB Study # 07-1691
Consent Form Version Date: October 24, 2007

Title of Study: Reinstatement of Preschoolers' Event Memory

Principal Investigator: Priscilla San Souci, B.A.
UNC-Chapel Hill Department: Psychology/Center for Developmental Science
UNC-Chapel Hill Phone number: 919-962-1462
Email Address: sansouci@unc.edu
Faculty Advisor: Peter A. Ornstein, Ph.D., 919-962-4138, pao@unc.edu
Funding Source: UNC

Study Contact telephone number: 919-962-1462
Study Contact email: sansouci@unc.edu

What are some general things you should know about research studies?
You are being asked to allow your child to take part in a research study. To join the study is voluntary. You may refuse to give permission, or you may withdraw your permission for your child to be in the study, for any reason. Even if you give your permission, your child can decide not to be in the study or to leave the study early.

Research studies are designed to obtain new knowledge. This new information may help people in the future. Your child may not receive any direct benefit from being in the research study. There also may be risks to being in research studies.

Details about this study are discussed below. It is important that you understand this information so that you and your child can make an informed choice about being in this research study.

You will be given a copy of this permission form. You and your child should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?
The purpose of this research study is to learn about how reminders influence children's memory of an event.

How many people will take part in this study?
If your child is in this study, your child will be one of approximately 64-80 people from 5 area preschools in this research study.

How long will your child's part in this study last?
Should you allow your child to participate, your child will be seen on four separate

occasions at a time that is convenient for both your child and your child's teacher. Each visit will last approximately 20-40 minutes for a total participation time of no more than two hours over a 6-week period.

What will happen if your child takes part in the study?
If your child takes part in the study, s/he will be seen on four separate sessions.

The first session will involve the completion of two popular standardized language tests to measure your child's language skills and will take about 20 minutes to complete. Immediately after this test, your child will participate in a structured "pretend camping event" with a researcher. The event includes a variety of materials, such as pretend food and backpacks to prepare for the adventure, a pretend pond in which to fish, and a campsite complete with a toy barbecue grill to cook the food. Indeed, this activity is quite fun for children. The camping event will be video and audio taped and will take approximately 20 minutes.

One day after participating in the camping activity, children's memory for the event will be measured by another researcher who will ask the children a series of questions. This researcher is a trained undergraduate student at UNC. This structured interview will be video and audio taped and will take about 20 minutes to complete.

Given the design of the project, some children who participate in the camping event will be randomly selected to receive a videotaped reminder or an additional interview about the event. This assignment means that your child's group will be randomly determined, much like using a coin toss.

Finally, around six weeks after the camping event, children's memory for the activity will once again be measured using a structured interview. This last memory interview will also be video and audio taped and will take about 20 minutes to complete.

What are the possible benefits from being in this study?
Research is designed to benefit society by gaining new knowledge. Your child may not benefit personally from being in this research study.

What are the possible risks or discomforts involved from being in this study?
There are no known risks for your child, should you choose to participate. There may be uncommon or previously unknown risks. You should report any problems to the researcher.

How will your child's privacy be protected?
To maintain confidentiality, all materials provided by your child, including audio and videotapes, would be labeled with an identification number and kept in a locked filing cabinet at UNC. The master list for the identification numbers that associates your child's name with an identification number will be kept in a separate locked cabinet and password protected computers. When publishing results from this study, only group findings will be reported and not any data from individual children.

Once this project is complete, the data will be permanently archived in a secured location so that in the future it might be used to address other research questions concerning children's memory. This archiving simply means that all data provided by your child (e.g., forms, videotapes, audiotapes) will be housed in a locked filing cabinet at UNC, in the event that other related research questions about remembering may be

answered by further analysis of the data. The only people with access to the archived data will be myself and trained research assistants.

Participants will not be identified in any report or publication about this study. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies for purposes such as quality control or safety.

Will your child receive anything for being in this study?
Your child will be receiving a book and a mug with a project logo for taking part in this study.

Will it cost you anything for your child to be in this study?
There will be no costs for being in the study

What if you are a UNC student?
You may choose not to give permission for your child to be in the study or to stop being in the study before it is over at any time. This will not affect your class standing or grades at UNC-Chapel Hill. You will not be offered or receive any special consideration if your child takes part in this research.

What if you are a UNC employee?
Your child's taking part in this research is not a part of your University duties, and refusing to give permission will not affect your job. You will not be offered or receive any special job-related consideration if your child takes part in this research.

What if you or your child has questions about this study?
You and your child have the right to ask, and have answered, any questions you may have about this research. If you have questions, or concerns, you should contact the researchers listed on the first page of this form.

What if you or your child has questions about your child's rights as a research participant?
All research on human volunteers is reviewed by a committee that works to protect your child's rights and welfare. If you or your child has questions or concerns about your child's rights as a research subject you may contact, anonymously if you wish, the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

- -

Title of Study: Reinstatement of Preschoolers' Event Memory

Principal Investigator: Priscilla San Souci, B.A.

<u>Parent's Agreement:</u>

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily give permission to allow my child to participate in this research study.

____
Printed Name of Research Participant (Child)

______________________________________ ________________
Signature of Parent Date

____
Printed Name of Parent

Thank you for agreeing to participate in this study. Below are two options for you to consider for how your data will be managed. As previously mentioned, once this project is complete, your data may be permanently archived in a secured location. We may also want to use images and/or audio files from the study in presentations. Please select your preferences regarding data management using the two sentences below. Your preferences will have no impact on your child's participation.

☐ Yes, you may archive my data for later use should further research questions arise.
☐ No, you may not archive my data for later use should further research questions arise.

☐ Yes, you may use images and/or audio files from our data for use in educational and professional settings.
☐ No, you may not use images and/or audio files from our data for use in educational and professional settings.

APPENDIX C: DEMOGRAPHIC QUESTIONNAIRE

ABOUT MY CHILD

Child's Information

1. Child's Full Name _____

   a. Child's Birth Date: _____/_____/_____

   b. Today's Date: _____/_____/_____

2. Child's Gender: ( ) Male ( ) Female

3. Child's Race: ( ) White ( ) African-American ( ) Latino/Hispanic ( ) Asian/Pacific Islander ( ) Other (please specify): _____

4. Are languages other than English regularly spoken in the home? ( ) Yes ( ) No

   If "Yes," which other language(s)? _____

   Including English, which language is spoken most often? _____

Parents' Information

5. Mother's Full Name_____
   a. Date of Birth _____/_____/_____
   b. Education/ Last grade in school completed_____
   c. Please check the description that best applies to the mother's typical week:

      ___ Parenting full-time at home without paid employment;
      ___ Non-custodial parent;
      ___ Combining parenting and full-time (35 hours of more) paid employment;
      ___ Combining parenting and part-time (20 hours of more) paid employment;
      ___ Combining parenting with some (less than 20 hours) paid employment;

   d. Please describe the mother's profession or occupation. [If not currently working professionally outside the home, please describe last employment.]

6. Father's Full Name_____

a. Date of Birth _____/_____/_____
b. Education/ Last grade in school completed_____
c. Please check the description that best applies to the father's typical week:

___ Parenting full-time at home without paid employment;
___ Non-custodial parent;
___ Combining parenting and full-time (35 hours of more) paid employment;
___ Combining parenting and part-time (20 hours of more) paid employment;
___ Combining parenting with some (less than 20 hours) paid employment;

d. Please describe the father's profession or occupation. [If not currently working professionally outside the home, please describe last employment.]

Please share with us some general information about your child's family.

7. Please list all of your child's brothers and sisters by age and gender:

	Birth Date	Gender	Does he/she live at home with your child?	
a.	_____/_____/_____	_____	( ) Yes	( ) No
b.	_____/_____/_____	_____	( ) Yes	( ) No
c.	_____/_____/_____	_____	( ) Yes	( ) No
d.	_____/_____/_____	_____	( ) Yes	( ) No

8. Is this your child's first year in a preschool program? ( ) Yes ( ) No
If "no," how many years has your child been enrolled in a preschool program?___

9. Were there any complications with your child's birth? ( ) Yes ( ) No
If "Yes," please check all that apply.
( ) Prematurity. How many weeks premature was your child? _____
( ) Low Birth Weight. What did your child weigh at birth? _____
( ) Hypoxia.
( ) Other _____

10. Please check one of the following:
( ) No one has expressed any concerns about my child's development
( ) I have no concerns about my child's development, but someone else has expressed concerns
( ) I have some concerns about my child's development
( ) I have many concerns about my child's development

If you or others have any concerns about your child's development, please answer question 11:

11. a. What concerns do you or others have about your child's development?

b. Have you talked about these concerns with a pediatrician or other professional (for example, a psychologist, social worker, early childhood educator, etc)?

( ) Yes ( )No

c. Please indicate if your child has received or is currently receiving any evaluation or treatment (e.g., speech therapy).

( ) Yes ( )No

12. Please list a few of your child's favorite activities.

13. Would you be willing to be contacted for future research studies? ( ) Yes ( ) No

---

Thank you for providing this important information!

APPENDIX D: LIST OF CAMPING FEATURES

Map
Backpacks
Path (and footprints)
Lantern
Fish
Pond
Fishing rod
Net
Hamburgers
Hotdogs
Buns
Chicken
Lettuce
Cheese
Tomato
Marshmallows
Drinks
Mustard
Potato chips
Grill
Frying pan
Pot
Tongs
Plates
Cups
Napkins
Tablecloth

APPENDIX E: ELABORATIVE EVENT SCRIPT

Map: (OEQ) “What is this?” “What should we use this map for?” (Statement) “This map has all three places we go to on this adventure.” (Association) “People often use maps when they aren’t sure where they are going, maps help you with directions.”

Backpacks: (OEQ) “What is this?” “How many backpacks are there?” “What color are the backpacks?” “Do you use a backpack like this to bring your books to school?”

Lantern: (OEQ) “What is this?” “Do you know what this lantern is for?” (Association) “This lantern is like a lamp, it gives off light so we can see.”

Drinks:(OEQ) “Do you know what these containers are?” (Statement) “These are called canteens, they hold our drinks, like cups.”

Path (and footprints): (OEQ) “What is this?” “What are the pictures on this path?” “Where does this path take us?” (Statement) “This path is all different colors.”

Fish: (OEQ) “What are these things in the pond?” “How many fish are there?” “What color are the fish?”

Pond: (OEQ) “What is this?” (Statement) “The pond is like a small lake where fish swim.” “The pond is a pretty, blue color.”

Fishing rod: (OEQ) “What is this?” “Do you know how this fishing rod works?” “What can you do with this fishing rod?” (Statement) “The end of the line has a magnet to put in the fish’s mouth.” “You wind the reel to pull the fish up.”

Net: (OEQ) “What is this?” “What should we do with this net?” (Statement) “You can put the fish in the net to carry them.”

Chicken: (OEQ) “Do you know what this is?” “Have you ever eaten a chicken leg like this before?”

Cheese:(OEQ) “What is this?” “What kind of cheese is this?” (Statement) We can use this cheese to make cheeseburgers.”

Marshmallows: (OEQ) “What is this?” “What should we do with marshmallows?” “Why do you think the marshmallows are on a stick?” (Statement) “I think we should roast the marshmallows on the campfire.”

Mustard: (OEQ) “What is this?” “How do you know this is mustard?” or “I think it is mustard, why would I think that?”

Grill: (OEQ) “Wow, what is this?” (Association) “Have you ever seen a grill like this before?” “Where?” “We have to be careful cooking on the grill because it is hot.”

Tongs: (OEQ) “Do you know what this is?” “What can you use the tongs for?”(Statement) “These are tongs, you can use them to pick something up.”

Tablecloth: (OEQ) “What is this?” “What color is the tablecloth?”

APPENDIX F: EMPTY EVENT SCRIPT

Map: (OEQ) “What is this?” (YNQ) “Do you want to carry it?” (Statement) “This is neat.” “I like the pictures.”

Backpacks: (OEQ) “What is this?” (Statement) “I’m going to carry this.” “I’m going to put this [food] in mine.” “This holds a lot of stuff.”

Lantern: (OEQ) “What is this?” (YNQ) “Can you carry this to the campsite?” (Statement) “This is cool.”

Drinks:(OEQ) “What are these?” (Statement) “I’ll carry this.”

Path (and footprints): (OEQ) “What is this?” (YNQ) “Should we follow this?” (Statement) “This is neat.” “I like the pictures.”

Fish: (OEQ) “What are these?” (YNQ) “How neat, can you get one?” (Statement) “I like fish.”

Pond: (OEQ) “What is this?” (Statement) “I like ponds.”

Fishing rod: (OEQ) “What is this? (YNQ) “Do you want to hold this? “Can I use it now?” (Statement) “This is neat.” “I like fishing.”

Net: (OEQ) “What is this?” (YNQ) “Do you want to hold this?” (Statement) “I want to carry this.”

Chicken: (OEQ) “What is this?” (Statement) “I like chicken.”

Cheese: (OEQ) “What is this?” (YNQ) “Do you like cheese?” (Statement) “I’ll carry it.”

Marshmallows: (OEQ) “What is this?” (YNQ) “Do you want to carry it?” (Statement) “This is neat.”

Mustard: (OEQ) “What is this?” (Statement) “You carry that.”

Grill: (OEQ) “Wow, what is this?” (Statement) “That is neat.” “You should use that.”

Tongs: (OEQ) “What is this?” (YNQ) “Do you want to use them?” (Statement) “These are neat.”

Tablecloth: (OEQ) “What is this?” (Statement) “This is nice.”

APPENDIX G: MEMORY INTERVIEW

Introduction

"I'd like to talk with you about the camping trip that you had with Priscilla. I wasn't here when you and Priscilla had your camping trip, so I don't know what you did. I want you to remember everything that you did."

I. **General Open-Ended Questions**

1. What did you do on the camping trip? Tell me all about the camping trip.

---IF CHILD **DOES NOT** PROVIDE A RESPONSE, FOLLOW FIRST QUESTION WITH:

1a. Tell me everything you remember about the camping trip. I want to hear all about it.

---IF CHILD **DOES** PROVIDE RESPONSE(S), FOLLOW WITH:

---**FOR EACH FEATURE NAMED, ASK**:

1a. You said there was a (feature). Tell me more about that.

2. Do you remember anything else about the camping trip?
Tell me everything you remember.

What else do you remember?

As child is responding to Questions 1 and 2 use only nonspecific prompts/encouragement and repetitions.

II. Specific Questions/Probed Recall about Aspects of the Event
(Note: If the child fails to correctly recall five questions, the interview is stopped.)

A. Packing up

1. Tell me about packing up to go on your camping trip. Tell me all about packing up.

---IF THE CHILD **DOES NOT** PROVIDE A RESPONSE TO THE INITIAL QUESTION ABOUT PACKING UP, FOLLOW WITH:

1a. When you were packing up, what did you put your stuff in?

---IF THE CHILD RESPONDS, FOLLOW WITH:

1b. What all did you put in the backpacks?

---**FOR EACH FEATURE NAMED, ASK**:

1c. You said there was a (feature). Tell me more about that.

---IF THE CHILD **DOES** PROVIDE A RESPONSE TO THE INITIAL QUESTION ABOUT PACKING UP, FOLLOW WITH:

2. Tell me what else you did to pack up for the camping trip. Anything else?
---**FOR EACH FEATURE NAMED, ASK:**

2a. You said there was a (feature). Tell me more about that.

When the child has told you all that she or he can in response to the more general probes, proceed to the Yes-No Questions for those items not already mentioned.

3. Did you have a **backpack** on your camping trip?
3a. Tell me about the backpack.

3b. How many backpacks were there?

3c. What color were the backpacks?

3d. What all did you pack up in your backpacks?

4. (NF) Did you take any **animals** on your camping trip?
   4a. Tell me about the animals.

5. Did you have a **map** on your camping trip?
   5a. Tell me about it.

   5b. What did you use it for?

6. Did you bring a **lantern** on your trip?
   6a. Tell me about that lantern.

7. Was there a walking **path** on your camping trip?
   7a. Tell me about that path.

   7b. Were there footprints on that path?

   7c. What kind of footprints were on that path?

B. Fishing

8. What did you do after you packed up to go on the camping trip?
9. Tell me all about fishing.
   9a. What else do you remember about fishing? Anything else?

   ---**FOR EACH FEATURE NAMED, ASK:**

   9b. You said there was a (feature). Tell me about that.

When the child has told you all that she or he can in response to the more general probes, proceed to the Yes-No Questions for those items not already mentioned.

10. Were there some **fish**?
    10a. Tell me about the fish.

    10b. How many fish were there?

    10c. What color were the fish?

    10d. How did you catch those fish?

11. Was there a **pond**?
    11a. Tell me about the pond.

    11b. Was there anything in the pond?

12. (NF) Were there any **sharks**?

    12a. Tell me about the sharks.

13. Did you have a **fishing rod or pole**?

    13a. Tell me about the fishing rod/pole.

14. Did you have a **net**?
    14a. Tell me about the net.

15. (NF) Did you see any **boats**?

    15a. Tell me about the boats.

C. Campsite

16. What did you do after you fished at the pond?
17. What did you do at the campsite?
    17a. What else did you do at the campsite? Anything else?
18. What kind of food did you have? Tell me about that.
    - - -**FOR EACH FEATURE NAMED, ASK:**

    18a. You said there was a (feature). Tell me about that.

---AFTER ALL ITEMS NAMED SPONTANEOUSLY, FOLLOW WITH:

    18b. Do you remember other food you had?

When the child has told you all that she or he can in response to the more general probes, proceed to the Yes-No Questions for those items not already mentioned.

19. Did you have **hamburgers**?
    19a. Tell me about the hamburgers.

19a. Tell me about the hamburgers.

20. Did you have **hot dogs**?
    20a. Tell me about the hot dogs.
21. Did you have some **buns/bread**?
    21a. Tell me about the buns/bread.
22. (NF) Did you have some **macaroni**?
    22a. Tell me about the macaroni.
23. Did you have **chicken**?
    23a. Tell me about the chicken.
24. Did you have **lettuce**?
    24a. Tell me about the lettuce.
25. Did you have **cheese**?
    25a. Tell me about the cheese.
26. Did you have **tomatoes**?
    26a. Tell me about the tomatoes.
27. Did you have **marshmallows**?
    27a. Tell me about the marshmallows.
28. (NF) Did you have **pizza**?
    28a. Tell me about the pizza.
29. Did you have **drinks**?
    29a. Tell me about the drinks.
30. (NF) Did you have **ketchup**?
    30a. Tell me about the ketchup.
31. Did you have **mustard**?
    31a. Tell me about the mustard.
32. Did you have **potato chips**?
    32a. Tell me about the potato chips.
33. Did you have somethings to use to cook and eat your food?

---**FOR EACH FEATURE NAMED, ASK**:

33a. You said there was a (feature). Tell me more about that.

---AFTER ALL ITEMS NAMED SPONTANEOUSLY, FOLLOW WITH:

33b. Do you remember anything else you had to cook and eat your food?

When the child has told you all that she or he can in response to the more general probes, proceed to the Yes-No Questions for those items not already mentioned.

34. Did you have a **barbeque grill**?
    34a. Tell me about the grill.

35. Did you have a **frying pan** to cook your food?
    35a. Tell me about the frying pan.

36. Did you have a **pot** to cook your food?
    36a. Tell me about that.

37. Did you have **tongs**?
    37a. Tell me about the tongs.

38. Did you have **plates**?
    38a. Tell me about the plates.

39. Did you have **cups**?
    39a. Tell me about the cups.

40. Did you have **napkins**?
    40a. Tell me about the napkins.

41. Did you have a **tablecloth**?
    41a. Tell me about the tablecloth.

42. (NF) Did you have a **tent**?
    42a. Tell me about the tent.

Conclusion

1. What was your favorite part of the camping trip? What did you like the very best?
1a. Was there anything else that you really liked a lot?

APPENDIX H: MEMORY INTERVIEW CODING

This coding scheme was developed to determine the child's recall of the activity in terms of the features involved, as well as aspects of the event itself. The coding system, then, is divided into three parts: feature recall, feature elaborations, and memory elaborations. Within each of these parts, there are three divisions: general open-ended questions, prompted open-ended questions, and yes-no questions. These divisions parallel the hierarchical structure of the memory interview, which begins with general open-ended questions, proceeds to more specific (or prompted) open-ended questions, and finally to yes-no questions. Definitions of each of these are following:

Feature Recall

A child is given credit for recall of a feature if he or she names a feature of the activity. Feature recall can be in response to a general open-ended question (i.e., EXP:"What did you do on your camping trip?" CHI: "We had hamburgers") or a prompted open-ended question (i.e., EXP: "What did you put in your backpack?" CHI: "Hot dogs"). For features that were not nominated by the child after the open-ended questioning, children receive credit for remembering them by answering a yes-no question about the feature correctly ("Y" to a present feature and "N" to a non-feature).

Feature Elaborations

A child is given credit for an elaboration of a feature if he or she provides extra information about a feature in addition to just labeling it. It can be in response to a general open-ended question (i.e., EXP: "What else did you do when you went camping?" CHI: "We had yellow fish and red fish" (2 elaborations for fish)) or a prompted open-ended question (i.e., EXP: "Tell me about that backpack." CHI: "It was red"). Though not as common, there can be yes-no questions in the feature elaboration category, such as "Were there footprints on that path?"

Memory Elaborations

A child is given credit for a memory elaboration when he or she provides information about the activity that is not necessarily feature-based. This can be in response to a general open-ended question (i.e., EXP: "What did you do on your camping trip?" CHI: "We ate some food") or a prompted open-ended question (i.e., EXP: "What did you do after fishing?" CHI: "We cooked all the food"). Again, though not as common, there can be yes-no questions in the memory elaboration category, such as "Did you put some stuff in your backpack?" In other words, memory elaborations are a way at determining the rest of what the child remembered about the event that was not necessarily related to a specific feature of the event.

APPENDIX I: MEMORY INTERVIEW SCORING SHEET

CAMP	Features Recalled			Feature Elaborations			Memory Elaborations		
	GOEQ	POEQ	Y/N	GOEQ	POEQ	Y/N	GOEQ	POEQ	Y/N
backpack									
animals(NF)									
lantern									
path									
map									
fish									
pond									
sharks(NF)									
rod/pole									
net									
boats(NF)									
hamburger									
hotdogs									
buns									
macaroni(NF)									
chicken									
lettuce									
cheese									
tomatoes									
marshmallows									
pizza(NF)									
drinks									
ketchup(NF)									
mustard									
potato chips									
grill									
frying pan									
pot									
tongs									
plates									
cups									
napkins									
tablecloth									
tent(NF)									

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