

Maternal Structure and Autonomy Support in Conversations About the Past: Contributions to Children's Autobiographical Memory

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The authors examined the contributions of maternal structure and autonomy support to children's collaborative and independent reminiscing. Fifty mother–child dyads discussed past experiences when the children were 40 and 65 months old. Children also discussed past events with an experimenter at each age. Maternal structure and autonomy support appeared as 2 distinct and separable components of mothers' reminiscing style and acted in an additive fashion to predict children's memory. Children whose mothers demonstrated both high structure and high autonomy support provided the greatest memory in these conversations, whereas children whose mothers were low on both dimensions provided minimal memory. The authors discuss the implications of these effects for children's autobiographical memory development.

Autobiographical memory is our store of past events that have personal meaning. The process of collecting autobiographical memories begins in early childhood from a variety of sources (for reviews, see Nelson & Fivush, 2004; Reese, 2002a, 2002b). One important source of autobiographical memory is the conversations that children have with parents and other adults about personally experienced past events.

Parental Reminiscing Style

Parents vary dramatically in the frequency and style of their conversations about past events with their children (e.g., Engel, 1995; Fivush & Fromhoff, 1988). Some parents are highly elaborative in the way they discuss the past with their children (Reese & Fivush, 1993). These "high-elaborative" parents introduce a great deal of new information about the event, often in the form of open-ended elaborative questions such as "What animal did we see at the zoo that was really big and furry?" High-elaborative parents also confirm their children's responses frequently. Fivush and Reese (2002) described high-elaborative parents as being more supportive of their children's point of view in past-event conversations, with a goal of collaborative reminiscing. In contrast, parents with a "low-elaborative" style of talking about the past use repeated questioning about the event with little new information.

Conversations between children and low-elaborative parents tend to be shorter because children participate less and provide less memory information themselves. This style has also been called "topic-switching" because these parents tend to introduce a new topic when they find their child is not responding (McCabe & Peterson, 1991). Moreover, less elaborative parents respond differently to a child's "empty" conversational turn (e.g., "I do not know") by repeating their previous question, whereas highly elaborative parents respond to the same child utterance with further elaboration of their own previous question (Fivush & Fromhoff, 1988; Reese, Haden, & Fivush, 1993). Fivush and Reese (2002) described low-elaborative parents as having a specific memory agenda for their children, with a goal of maximizing their children's performance.

Correlates and Consequences of Reminiscing Style

A highly elaborative parental reminiscing style is positively associated with children's recall and responding in the same conversation (e.g., Engel, 1995; Fivush & Fromhoff, 1988; Hudson, 1990). Over time, mothers' highly elaborative reminiscing style predicts children's elaborative reminiscing, both with mothers and with others (Farrant & Reese, 2000; Haden, Haine, & Fivush, 1997; Reese et al., 1993). Children's early self-awareness, language, memory, and attachment security are also important for their later remembering, but maternal reminiscing style is uniquely predictive of children's reminiscing (Reese, 2002a).

Recent experimental evidence bolsters the importance of maternal reminiscing style for children's autobiographical memory. Peterson, Jesso, and McCabe (1999) trained a group of low-income mothers to talk with their 3-year-old children about the past in an elaborative, topic-extending fashion. Two years after the intervention, at age 5, children in the experimental group told longer and more complex narratives about personal experiences than did children in a control group. Boland, Haden, and Ornstein (2003) also trained mothers to adopt an elaborative style, but in this case, mothers were encouraged to use an elaborative style during the encoding phase of a novel event. Children of trained

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mothers later recalled more details about the event (but not necessarily more "core features") than did children of untrained mothers. Finally, McGuigan and Salmon (2004) contrasted the effects of an adult elaborative questioning style on children's verbal recall before, during, and after a novel event. Preschoolers who experienced the postevent elaborative style (similar to a reminiscing condition) recalled more about the event after a delay. Older preschoolers (5-year-olds) also benefited in their recall from a pre-event elaborative style. Together, the experimental evidence indicates a positive effect of an elaborative conversational style before, during, and after an event on children's verbal recall.

Mechanism of Reminiscing-Style Effects on Children's Memory

A highly elaborative reminiscing style is composed of several features: open-ended elaborative questioning, confirmations, provision of new information, and a willingness to follow in on children's memory provisions. These are the elements that have been isolated as important in the correlational work (e.g., Farrant & Reese, 2000; Haden, 1998) and that have been targeted in all of the experimental work on reminiscing style to date. In the molar categorizations of the high- and low-elaborative styles, the assumption is that these specific techniques are indicative of different goals for remembering. Engel (1986) was the first to distinguish between "reminiscers" and "practical rememberers." Mothers who are reminiscers have the goal of getting the child to participate more fully in collaborative reminiscing for its own sake, whereas mothers who are practical rememberers have the goal of demonstrating the child's memory performance. Yet these larger goals for remembering and the degree to which mothers are taking children's event perspectives into account have been overlooked when it comes to coding the memory conversations. The success of the training studies leads us to conclude that perhaps a goal of collaborative reminiscing is not essential for taking on the elaborative style, unless we are to assume that mothers' goals can be changed through a brief intervention. None of the experimental work has attempted to change directly mothers' goals for reminiscing. The experimental work has instead focused on training mothers in specific techniques, for instance in open-ended questioning and confirming children's responses. The child-centered aspect of the elaborative style has also been part of each of the elaborative interventions. For instance, in the Peterson et al. (1999) intervention, researchers instructed mothers to engage in several specific questioning techniques but finally to "follow your child's lead. That is, talk about what your child wants to talk about" (p. 53). In the Boland et al. (2003) intervention, researchers instructed mothers in the use of open-ended elaborative questioning, making associations between the target event and related events and providing positive evaluations of children's responses, but also instructed them to follow in on the child's interests or conversational topics. Thus, we are not able to isolate the added contribution of the structural support that mothers are giving children, in the form of additional information and open-ended elaborative questions, from the contribution of their willingness to follow in on the child's perspective, in analyzing the effects of these contributions on children's memory reports. Presumably, both aspects of a highly elaborative style are important for children's memory, but

research to date has focused primarily on the contribution of the structural aspects of this style.

Self-Determination Theory

Self-determination theory may provide a useful framework for understanding the multiple ways that maternal reminiscing style might be affecting children's memory. Self-determination theorists (Deci & Ryan, 1985; see Grolnick, 2003, for a review) assert that children have three basic needs: autonomy, competence, and relatedness. Parents and other adults can help children fulfill these three basic needs by being supportive of children's autonomy, by providing children with appropriate levels of structure, and by relating to children in a warm and affectionate manner. These three dimensions are hypothesized to be independent, such that a parent may be supportive of a child's autonomy yet not provide appropriate structure in a warm and affectionate manner. The three dimensions are also proposed to have independent effects on children's motivation, sense of self-efficacy, and sense of relatedness, respectively.

The first tenet of self-determination theory is that parents who support their children's interests, rather than their own (i.e., who are autonomy supportive), will encourage their children to be intrinsically, rather than extrinsically, motivated to continue engaging in a task. For instance, mothers who encourage their children's artistic efforts by letting children draw what, when, and how they wish will be encouraging their children to be intrinsically motivated to continue drawing. In other words, children will have internalized the worth of drawing and will be internally motivated to progress in their drawing skill. Mothers who are more controlling by telling children what, when, and how they should draw, and who offer external rewards for drawing, will be fostering an extrinsically motivated orientation toward drawing. The child will draw to please others or for a reward but not for the sheer enjoyment of drawing. Mothers can be reliably classified as autonomy supportive or controlling (Grolnick, Frodi, & Bridges, 1984); moreover, these classifications appear to be relatively stable across children's development and across tasks, although some tasks and instructional sets "pull" for more controlling maternal behavior on average (e.g., Grolnick & Gurland, 2002).

A second tenet of self-determination theory is that the structure that parents provide for a task will be related to children's competence on the task and their sense of self-efficacy (Deci & Ryan, 1985; Grolnick, 2003). Structure is hypothesized to be a dimension independent from autonomy support, such that a parent could provide a high degree of structure for a task but could do so in a controlling way. Structure can be thought of as providing children with the tools for completing a task. For instance, a mother might be supportive of a child's autonomy in drawing but might not provide the child with the necessary tools (paper, drawing supplies, art area) for doing so. In this case, the child might become intrinsically motivated toward drawing but not be highly competent given the limited opportunities to practice. Similarly, a mother might provide the child with a fantastic array of tools for creating art, thus providing high structure, but might be controlling in the way the child uses those tools. The child might thus become a competent artist but be extrinsically motivated toward drawing.

A final tenet of self-determination theory is that the child's third basic need, after autonomy and competence, is that of relatedness.

Parents who are warm and affectionate promote a sense of connectedness in their children. Parental warmth is, then, yet another independent dimension from autonomy support and structure. The additive prediction is that parents who are high on autonomy support, structure, and warmth are encouraging optimal outcomes for their children's development in terms of motivation, competence, and a sense of connectedness.¹

Applying Self-Determination Theory to Mother–Child Reminiscing

These three dimensions of parenting style can be extended to mother–child reminiscing to help provide an understanding of the effects of maternal reminiscing style on children's memory.

Maternal Warmth During Reminiscing

Maternal warmth in the form of physical closeness and tone of voice was directly measured in Fivush and Vasudeva's (2002) study of mother–child reminiscing; however, these authors did not find a significant link between maternal warmth and children's memory contributions. Rather, children's attachment security appears to provide the strongest link between mothers' elaborations and children's memory responding, with securely attached children and their mothers having richer, more in-depth conversations about the past, especially when talking about emotional experiences (Etzion-Carasso & Oppenheim, 2000; Farrar, Fasig, & Welch-Ross, 1997; Fivush & Vasudeva, 2002; Laible & Thompson, 2000; Reese & Farrant, 2003). Newcombe and Reese (2004) isolated the link between children's attachment security and memory specifically to mother–child evaluations of past events and not to other aspects of memory. Thus, children's attachment security is linked to more emotional memories, but maternal warmth during reminiscing appears not to be directly implicated in children's memory per se. In this study, we were interested in children's overall memory provisions, so we did not include maternal warmth as a factor.

Maternal Structure During Reminiscing

Parents who offer children new information in the form of an open-ended question are giving children good structure for engaging in the task, which is difficult for children to complete on their own until the school-age years (Reese et al., 1993). Parents who do not provide any questions at all, or who provide children only with yes–no or repeated questions, are not providing very young children with the necessary tools for participating in reminiscing. All of the research reviewed above on maternal questioning style, as it fosters children's memory, is relevant in this regard. As we mentioned above, however, the experimental research to date has conflated maternal provision of structure (in the form of open-ended elaborative questions) with mothers' willingness to follow in on their child's conversational lead.

Maternal Autonomy Support During Reminiscing

Autonomy support is predicted to affect the child's motivational stance toward an activity. Parents who are more autonomy supportive in reminiscing would be expected to have children who are more interested in reminiscing for its own sake, whereas parents

who are more controlling would be expected to have children who are less motivated to engage in reminiscing. No research has directly examined the effect on children's memory of a parent's willingness to follow in on a child's lead, although, as we noted above, the training studies used this strategy as part of the training package. The "reminiscers" first noted by Engel (1986) appear to be encouraging an intrinsic motivation toward reminiscing by approaching the task in a collaborative fashion and letting the child lead the interaction when he or she shows interest in a topic. Engel's "practical rememberers," in contrast, may be fostering extrinsic motivation by being more directive about the correct way to remember events. The idea of autonomy support in reminiscing also has some overlap with Fivush's (2000) notion of how adults give "voice" to children's memories. Fivush noted that parents are implicitly or explicitly telling children in these conversations what is and is not appropriate to discuss. Sometimes the omissions are even more important than what is discussed, as in the case of failing to talk about a traumatic or abusive event in the child's life. Fivush's (2004) argument contains a second dimension: that of whether the event under discussion is from the child's perspective or another's perspective. A parent may encourage a child to give voice to his or her own experience, and in this way would be autonomy supportive, but if the parent is encouraging the child to give voice to and comply with the parent's perspective, then this style would be considered more controlling. In the everyday-event conversations we are studying, the variability lies mainly in whether or not mothers follow in on children's responses, not in mothers' denial that a whole event occurred or in mothers' explicit rejection of a child's memory of an event.

The Present Study

We propose that previous conceptualizations of maternal reminiscing style have failed to consider the separate and combined contributions of structure and autonomy support to children's autobiographical memory. We make a start in this direction by contrasting the dimensions of naturally occurring structure and autonomy support in mother–child conversations about the past in relation to children's collaborative reminiscing with mothers and independent reminiscing with an experimenter. We examined mother–child reminiscing at 40 and 65 months of age because, by 40 months, early child factors have given rise to a stable maternal reminiscing style that is the best direct predictor of children's later reminiscing (Reese, 2002a). By 65 months, children are fully capable of independent reminiscing (Fivush, Haden, & Adam, 1995; Haden et al., 1997), and past research (compare Haden et al., 1997; Reese et al., 1993) has suggested that maternal structural style generalizes to children by the end of the preschool years, such that children appear to internalize their mothers' structural style by

¹ As might be expected, maternal autonomy support and maternal warmth are related to children's attachment security, such that mothers who are more autonomy supportive and more affectionate tend to have children who are more securely attached (Frodi, Grolnick, & Bridges, 1985). Other aspects of mothers' behavior, however, are also predictive of attachment security, such as their sensitivity in responding appropriately to their child's needs (De Wolff & van IJzendoorn, 1997). "Sensitive responding" in the studies of attachment security most likely conflates maternal provision of warmth, structure, and autonomy support.

Table 1
Predicted Child Memory as a Function of Maternal Structure and Autonomy Support

Maternal structure	Autonomy support	
	Controlling	Autonomy supportive
Low elaborative	Minimum child memory	Moderate child memory
High elaborative	Moderate child memory	Maximum child memory

the time they are 5 or 6 years old. An intermediate version of independent reminiscing is present in mother–child conversations about unshared events, that is, when mothers question children about a past event that children experienced without the mother (Reese & Brown, 2000). We captured this development from heavily scaffolded memory to less scaffolded memory by assessing children's memory with mothers for both shared and unshared experiences, as well as children's independent memory with an experimenter, at each time point.

We coded the conversations independently for maternal structure in the form of elaborative questioning (Haden, 1998; Reese, 2002a) and for autonomy support in the form of following in on the child's point of view (a method adapted from Grolnick et al., 1984). We predicted that children's memory would be highest when mothers adopted a style that was high both in structure and autonomy support. We predicted that children whose mothers adopted a style that was either high in structure or high in autonomy support would display moderate memory competence, and that children whose mothers provided low structure and were controlling would offer the fewest provisions of memory information (see Table 1 for these predictions).

Method

Participants

The present study was conducted as part of an ongoing longitudinal study investigating children's autobiographical memory development.² Sixty-five New Zealand mother–child dyads participated in this longitudinal study. Mothers and children were recruited through public birth records and advertisements placed in the local community of Dunedin, New Zealand. The dyads were visited at 6 time points, beginning when children were within 2 weeks of their 19-month birth date. The two relevant data points for this study took place at 40 months ($M = 40.2$ months, $SD = 18.1$ days) and 65 months ($M = 65.2$ months, $SD = 13.7$ days). Fifteen dyads were excluded from the present analyses because they did not complete the study: 11 families moved and 4 dyads chose not to continue in the study. The sample for the present study therefore consisted of 50 mother–child dyads. Twenty-five boys and 25 girls were included in the sample. Twenty of these children were firstborn children. Forty-five families were of New Zealand European descent; 4 children had one or both parents who were New Zealand Maori; and 1 child had one parent of Asian descent. English was the primary language spoken in all of the homes. Children came from primarily middle- and working-class families, according to Elley and Irving's (1976) scale of fathers' occupational status. The children's mothers had an average of 13.2 years of education ($SD = 2.35$ years) at the beginning of the study, and all mothers identified themselves as the child's primary caregiver. Children received small gifts for their participation at the conclusion of each time point.

Procedure

Two researchers visited the children and their mothers in their homes for three sessions at the 40-month time point and for two sessions at the 65-month time point. Sessions within each time point were approximately 1 week apart. The primary researcher, who conducted the majority of the child measures, remained the same within the sessions of each time point but changed across time points. All primary researchers were female. At the first session of each time point, mothers completed a consent form.

Measures

Children's language. Children's expressive language was measured at the 40- and 65-month time points with the Expressive Vocabulary Test (EVT; Williams, 1997). The EVT is an expressive language measure that gauges language production. This task has two components: In the first component, the child is asked to provide the names of presented pictures and objects, and in the second component, the researcher names a picture and asks the child to supply a synonym. The EVT was adapted for use with a New Zealand sample (see Reese & Read, 2000). Words common to New Zealand English but not to American English were accepted as correct for the purposes of this study; for example, *wardrobe* was accepted for *closet*, and *rubbish* was accepted for *garbage*. The EVT was conducted in Session 2 at each time point in the standard manner for the children's age. Standard scores were used as the final measure of children's expressive language.

Memory conversations. Mothers were asked to choose four past events at each time point to discuss with their children. Researchers told mothers that we were interested in the information that young children remember about one-time events in their personal past. Mothers were therefore requested to choose novel past events that had occurred on only one occasion, events that were not scripted routines, that were of relatively short duration (having occurred within the span of 1 day), and that did not already have a story line inherent in them (such as the plot of a book or a movie). The selection of events to be discussed took place out of the child's hearing range. Three events at each time point were "shared" events, which the mother and child had experienced together. One event at each time point was "unshared," which the child had experienced without the mother. The order of shared and unshared event conversations was counterbalanced. Examples of events discussed by mothers and children include a trip to a museum for a dinosaur exhibit and a visit to the dentist. Mothers were instructed to discuss these events in whatever way was most natural and comfortable for them, and no time constraints were placed on the length of conversation. The researchers remained out of the room for the duration of these mother–child memory conversations.

In a separate session at each time point, a female experimenter also interviewed the children about three past events in order to obtain a measure of children's independent recall. Mothers selected these past events at the same time they selected events for the mother–child discussions, and the events they chose were randomly assigned to the mother–child shared conversations or the experimenter–child conversations. The events that children were asked to recall had not been discussed at any of the previous time points. In the interview, experimenters introduced the event to children by saying, for example, "Your mum told me that you visited some mud pools. Tell me all about the time you went to the mud pools." After giving the title of the event, experimenters gave only general prompts such as "Anything else?" and "Tell me some more about going to the mud pools" and confirmed the children's responses, until children indicated they had told the experimenter everything they could remember about the event.

² The larger ongoing study included measures of children's self-recognition, attachment security, temperament, nonverbal memory, theory of mind, and self-development from 1½ to 5½ years of age.

The order of the experimenter–child memory conversations was counterbalanced with the mother–child conversations at each time point. All conversations were videotaped and audiotaped for later transcription.

Maternal autonomy support coding. The present coding scheme, adapted from Grolnick et al. (1984), was designed to measure maternal autonomy support and control in past event conversations between mothers and their children. Maternal conversational turns were coded along a continuum for how autonomy supportive or controlling they were in the context of a given conversation. Specifically, the coding scheme was composed of a 5-point scale ranging from *controlling* to *autonomy supportive* (see Table 2). Each maternal turn was coded for its functional significance within the conversation. A turn was considered autonomy supporting if it functioned to validate the child's memory contributions and if it acted to follow the child's conversational lead. A turn was considered controlling if it functioned to negate the child's memory information and to promote the mother's own memories and conversational agenda.

Two raters independently coded 25% of the transcripts at each of the two time points. Using a Shrout-Fleiss intraclass correlation (Shrout & Fleiss, 1979), we calculated the interrater reliability for the transcripts at 40

months as .82 and at 65 months as .72. These correlations are up to standard with the existent literature (see Shrout & Fleiss, 1979). The intraclass correlation accounts for the fact that ratings were made in terms of an ordered scale such that some disagreements were larger than others (e.g., a discrepancy between 2 and 4 is a larger disagreement than one between 2 and 3). It also takes into account the likelihood of chance agreement given the base-rate probabilities of scores at each level. This correlation coefficient has been used to determine interrater agreement in previously reported analyses using this type of coding scheme (e.g., Grolnick & Ryan, 1989).

At each time point, after calculating reliability, we discussed and resolved all disagreements between coders, and we then divided the remaining transcripts between the two coders, who coded them independently. The mother's average autonomy support score across all conversational turns in an event was used as the final score per conversation.

Structural coding of mother–child elaborations. Mother–child conversational utterances were coded exhaustively for structure in accordance with previously used coding schemes that measure different types of elaborative questions and statements, repetitions, confirmations, and asso-

Table 2
Coding for Maternal Autonomy Support and Control During Reminiscing

Code	Definition	Example
Controlling (1)	Turn functions to entirely change the topic of conversation or explicitly negates the child.	Mother: Was it painful? Child: No. Mother: It wasn't painful? Why wasn't it painful? Child: Because it wasn't. Mother: Okay alright, then was your mouth sore? Mother: Your mouth wasn't sore? Mother: Not even the next day? Child: No. Mother: Okay then that's good, I'm glad you don't remember that.
Moderately controlling (2)	Turn functions to change the specific focus of the conversation or gently negates the child.	Mother: And what was she wearing? Child: Um, she was wearing, um, a white dress and big gloves up to here. Mother: Cool. Were there other colors on it? Child: And she had something round her head. Mother: And who did she go with? Another princess? Who did she go with?
Neutral (3)	Turn functions to continue the general topic/agenda of conversation but in a specific direction.	Mother: What was so special about the frog pond? Child: Because the water was over. Mother: Was over what? Child: The bridge. Mother: So what did we have to do? Child: We had gumboots. Mother: Why? How deep was the water?
Moderately autonomy supportive (4)	Turn functions to sustain child's topic/agenda in the conversation.	Child: He was doing, he was only doing the exercises, eh? Mother: Yes, and who else did exercises? Child: You. Mother: Yeah, remember what the exercises were? Child: To keep xx over line. Mother: Yeah, yes, it was, wasn't it? Trying to get it up over the top, wasn't it?
Autonomy supportive (5)	Turn functions to continue or expand on child's topic/agenda in the conversation.	Child: But I loved the other, the ones construction, that was my favorite. Mother: That was the name of them, wasn't it? What was it? Child: Under construction. Mother: Kids Under Construction, good [gender], gosh you've got a good memory.

ciated event talk (see Reese & Brown, 2000; Reese et al., 1993; Haden, 1998), but only mothers' open-ended elaborative questions and children's memory elaborations were used in the present analyses. Open-ended elaborative questions are usually *wh*- questions containing at least one new piece of information about the event (e.g., "What animals did we see at the zoo?"). They have been identified as the critical maternal structural variable for children's memory (Farrant & Reese, 2000; Haden, 1998). Children's memory was assessed by their provisions of memory elaborations, which are provisions of new memory information (e.g., "We saw monkeys"), in each type of conversation.

The unit of analysis for each code was the independent clause (subject + verb + complement structures). Two new coders independently coded 25% of the transcripts at each time point. The remaining transcripts were coded by one coder. Reliability between the two independent coders ranged from 84.5% to 88.6% for mothers' and children's codes across time points.

Results

Preliminary Analyses

Two mother-child dyads did not discuss an unshared event at the 40-month time point. Six children at 40 months and two children at 65 months did not complete the EVT. Group means were substituted for the missing data points to preserve the full sample across the two data points (Tabachnick & Fidell, 1989). See Table 3 for the means and ranges of mothers' elaborations and autonomy support in all contexts.

In support of the proposed independence of the dimensions of maternal structure and maternal autonomy support (i.e., a mother can be autonomy supportive without necessarily providing high structure), we obtained no significant correlations between mothers' open-ended elaborative questions at either time point, in either the shared or unshared context, and maternal autonomy support across time and context (*rs* ranged from $-.27$ to $.04$, *ns*). Instead, mothers' elaborative questions correlated across context and time (*rs* ranged from $.19$ to $.65$, with four out of six correlations significant at $p < .05$). Mothers' autonomy support was also significantly correlated across context and time (*rs* ranged from $.07$ to $.59$, with three out of six correlations significant at $p < .05$).

Table 3
Means and Ranges of Mothers' Elaborations and Autonomy Support

Context	<i>M</i>	<i>SD</i>	Range
Elaborations			
40 months			
Shared	4.39	2.39	1–12
Unshared	4.38	2.53	0–11
65 months			
Shared	15.58	7.45	4–40
Unshared	5.48	3.36	0–14
Autonomy support			
40 months			
Shared	2.80	0.42	1.75–3.50
Unshared	2.83	0.65	1–4
65 months			
Shared	2.81	0.27	2.23–3.37
Unshared	2.89	0.43	2.00–3.77

With the independence of the two dimensions established, we then wanted to group mothers on the basis of their structure and their autonomy support to test the additive predictions illustrated in Table 1. In past research, characterizations of maternal style have been based on conversations about shared, not unshared, events (e.g., Fivush & Fromhoff, 1988; Reese et al., 1993). Therefore, we classified mothers as high or low on open-ended elaborative questions during shared event conversations at each time point on the basis of a median split. We acknowledge that such a division on the basis of the median score is somewhat arbitrary, and that mothers who are close to the median may be less stable in their category than other mothers with more extreme scores, but such a technique has been adopted in past research with robust effects related to children's memory (e.g., Fivush & Fromhoff, 1988). Autonomy support is conceptualized as a more traitlike variable that is relatively constant across contexts (Pomerantz & Eaton, 2001), so we constructed an average autonomy support variable across the four events at each time point and classified mothers as autonomy supportive or controlling, again on the basis of a median split. For analyses, mothers were then classified into one of four groups at each time point: low-structure/controlling, low-structure/autonomy-supportive, high-structure/controlling, or high-structure/autonomy-supportive. Mothers were relatively stable in their classifications across the two time points, $\chi^2(9, N = 50) = 14.32, p = .11$, and were significantly stable when the low-structure/autonomy-supportive and high-structure/controlling groups, for which we did not have differential predictions, were collapsed into one, $\chi^2(4, N = 50) = 13.38, p = .008$.

Main Analyses

Main analyses addressed the prediction that mothers who provided both high structure and autonomy support would have children who gave more memory provisions than children of mothers who were high on only one dimension or low on both. In all analyses, children's memory was measured via their mean elaborations per event in the shared, unshared, and independent memory contexts. We assessed our additive predictions through a series of one-way analyses of covariance (ANCOVAs) with maternal style (four levels) as the between-subjects factor on each of the three child memory variables at each time point. Children's concurrent expressive language was covaried in concurrent analyses, and their earlier language was covaried in long-term analyses. We predicted an additive effect on children's memory as a function of mothers' structure and autonomy support. Specifically, the lowest memory was expected for children whose mothers were in the low-structure/controlling group and the highest memory was expected for children whose mothers were in the high-structure/autonomy-supportive group; we predicted that children whose mothers were in the low-structure/autonomy-supportive group or the high-structure/controlling group would provide moderate memory (see Table 1). Significant effects of maternal style were followed up by Tukey's honestly significant difference (HSD) tests at $p < .05$ to test pairwise differences.

The first ANCOVA tested for differences in children's memory at 40 months as a function of mothers' style at 40 months, covarying children's EVT scores at 40 months (see Figure 1). The maternal style effect was significant for children's shared memory, $F(3, 45) = 3.96, p < .05$, and for children's unshared

memory, $F(3, 45) = 3.49, p < .05$. The maternal style effect was not significant for children's independent memory. Follow-up tests indicated that children of mothers who were high in structure and autonomy support provided significantly more shared memory than did children of mothers in any of the other three groups but that children of mothers in the low-structure/controlling, low-structure/autonomy-supportive, and high-structure/controlling groups were not significantly different from one another. For unshared memory, children whose mothers were in the low-structure/controlling group provided the least memory, followed by children of mothers in the low-structure/autonomy-supportive and high-structure/controlling groups, which were not significantly different from each other. Children whose mothers were in the high-structure/autonomy-supportive group provided a significantly greater amount of unshared memory than did children whose mothers were in the other three groups.

We next ran one-way ANCOVAs on children's 65-month shared, unshared, and independent memory as a function of 65-month maternal style group (four levels; see Figure 2). There was a significant effect of maternal style for children's shared memory, $F(3, 45) = 5.69, p < .01$, and for children's independent memory, $F(3, 45) = 2.89, p < .05$, but no significant effect of maternal style for children's unshared memory. Follow-up tests indicated that children whose mothers provided low structure and were controlling, or who provided low structure and were autonomy supportive, provided significantly less

shared memory than children whose mothers provided either high structure and were controlling or who provided high structure and were autonomy supportive. For children's independent memory, once again the high-structure/controlling and high-structure/autonomy-supportive groups provided the most memory. Children in the low-structure/controlling and low-structure/autonomy-supportive groups provided significantly less memory.

Finally, we ran ANCOVAs on children's 65-month shared, unshared, and independent memory as a function of mothers' 40-month style (four levels) to test long-term predictions (see Figure 3). Children's 40-month EVT scores were the covariate. Maternal style at 40 months significantly predicted children's shared memory at 65 months, $F(3, 45) = 3.68, p < .05$, but did not significantly predict children's unshared or independent memory at 65 months. Follow-up tests, with EVT as the covariate, indicated that children's shared memory was lowest when mothers were low in structure and were controlling, or were low in structure and were autonomy supportive; children's memory was significantly higher when mothers were in the high-structure/controlling group, and significantly higher still when mothers were in the high-structure/autonomy-supportive group. The 40-month maternal style effect became marginal, $F(3, 44) = 2.70, p = .06$, however, when mothers' 65-month elaborative questions and autonomy support were added as covariates, which suggests that any long-term contributions of early maternal structure and autonomy support to

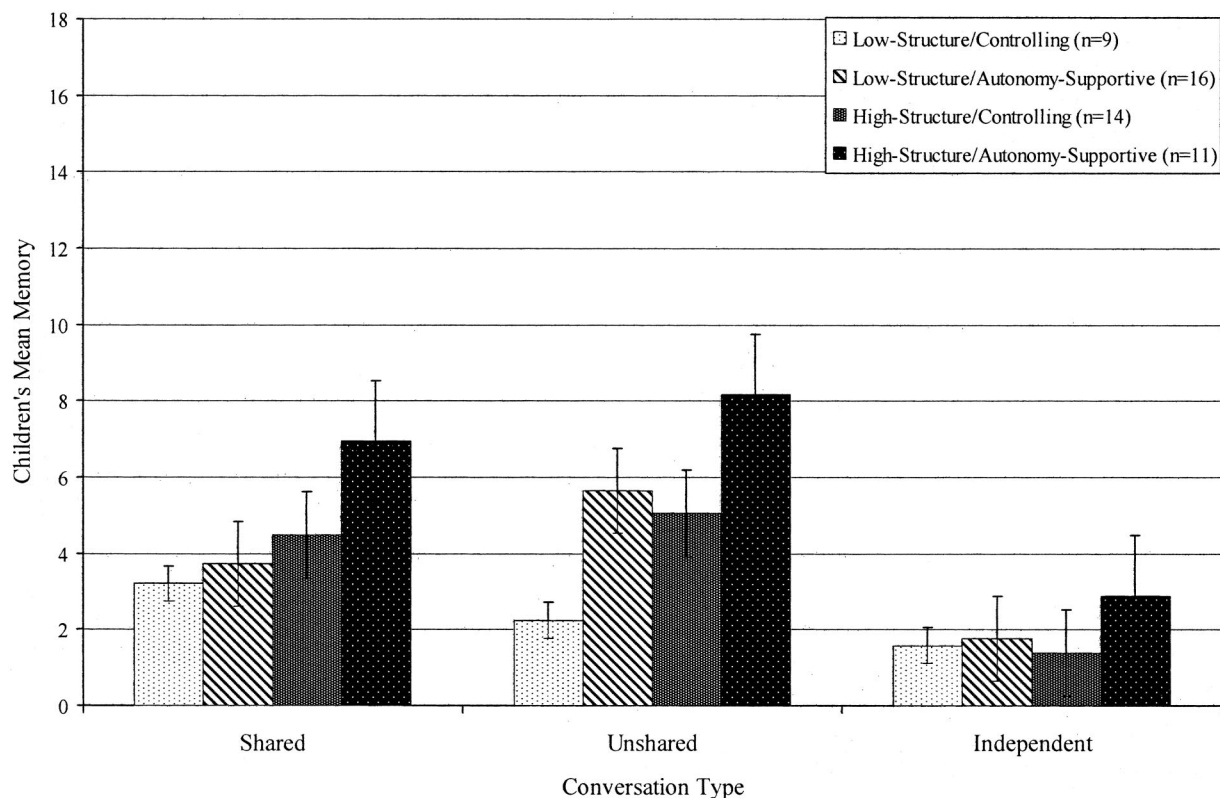


Figure 1. Children's mean memory per event as a function of concurrent maternal elaboration and autonomy support at 40 months.

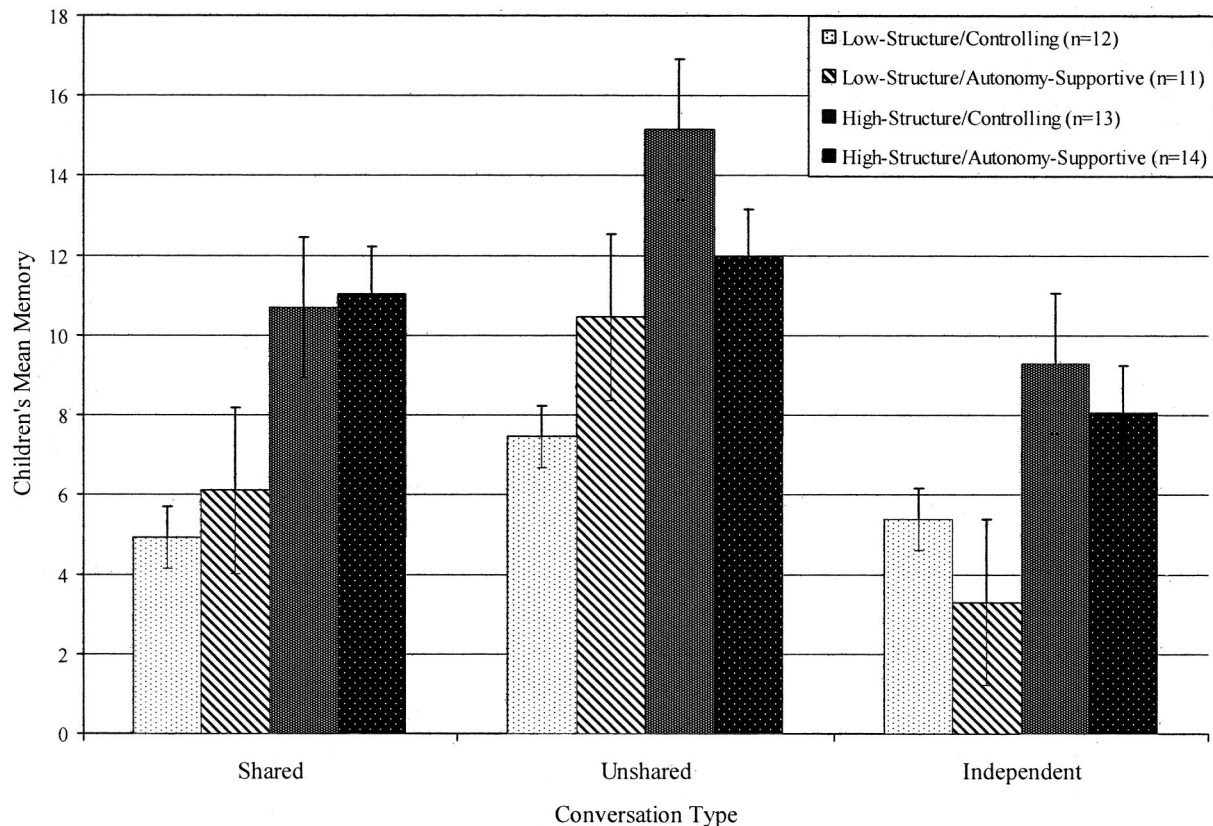


Figure 2. Children's mean memory per event as a function of concurrent maternal elaboration and autonomy support at 65 months.

children's shared memory are at least partially mediated through mothers' later structure and autonomy support.³

Discussion

Maternal structure, in the form of elaborative questioning, and maternal autonomy support emerged as independent dimensions of maternal reminiscing style: Relatively equivalent numbers of mothers fell into the four groups at each data point, and there were no correlations between our measures of maternal structure and autonomy support. Some mothers were low elaborative and controlling, some mothers were low elaborative and autonomy supportive, some mothers were high elaborative and controlling, and some mothers were high elaborative and autonomy supportive. This finding supports the prediction of self-determination theory that parental structure and autonomy support are two independent dimensions. Just because a mother is elaborative does not ensure that she is also supportive of her child's autonomy in reminiscing. The Appendix contains brief excerpts of conversations from each of the four maternal classifications, all taken from shared conversations at 40 months. The example from the low-elaborative, controlling mother is similar to the classic conceptualization of a practical rememberer (Engel, 1986), with the mother having a definite agenda for the child and providing very little in the way of elaborative structure. The example from the high-elaborative, autonomy supportive mother is similar to the classic conceptualiza-

tion of a reminiscer (Engel, 1986), with the mother providing high elaborative structure and following in on the child's perspective. The two remaining examples best illustrate the independence of the two dimensions because they are high on one dimension but low on the other. For instance, the example from the low-elaborative, autonomy supportive mother illustrates that a mother can be highly supportive of her child's agenda even when she is not providing elaborative structure. The example from the high-elaborative, controlling mother illustrates that a parent can be quite elaborative about a specific aspect of an event in a way that is controlling and not at all open to the child's perspective.

The analyses clarified how these maternal styles are linked to children's collaborative and independent memory. At 40 months, children whose mothers provided high structure and were autonomy supportive gave the most memory information in shared memory conversations compared with children of mothers in the other three groups. Moreover, in unshared conversations at this data point, children whose mothers provided low structure and were controlling provided significantly less memory than did

³ We also ran regression analyses using the continuous variables of structure and autonomy support. The results of these analyses bore out the same conclusions as above: Both maternal structure and autonomy support uniquely predicted children's memory at 40 months, but at 65 months, only maternal elaborations predicted children's memory.

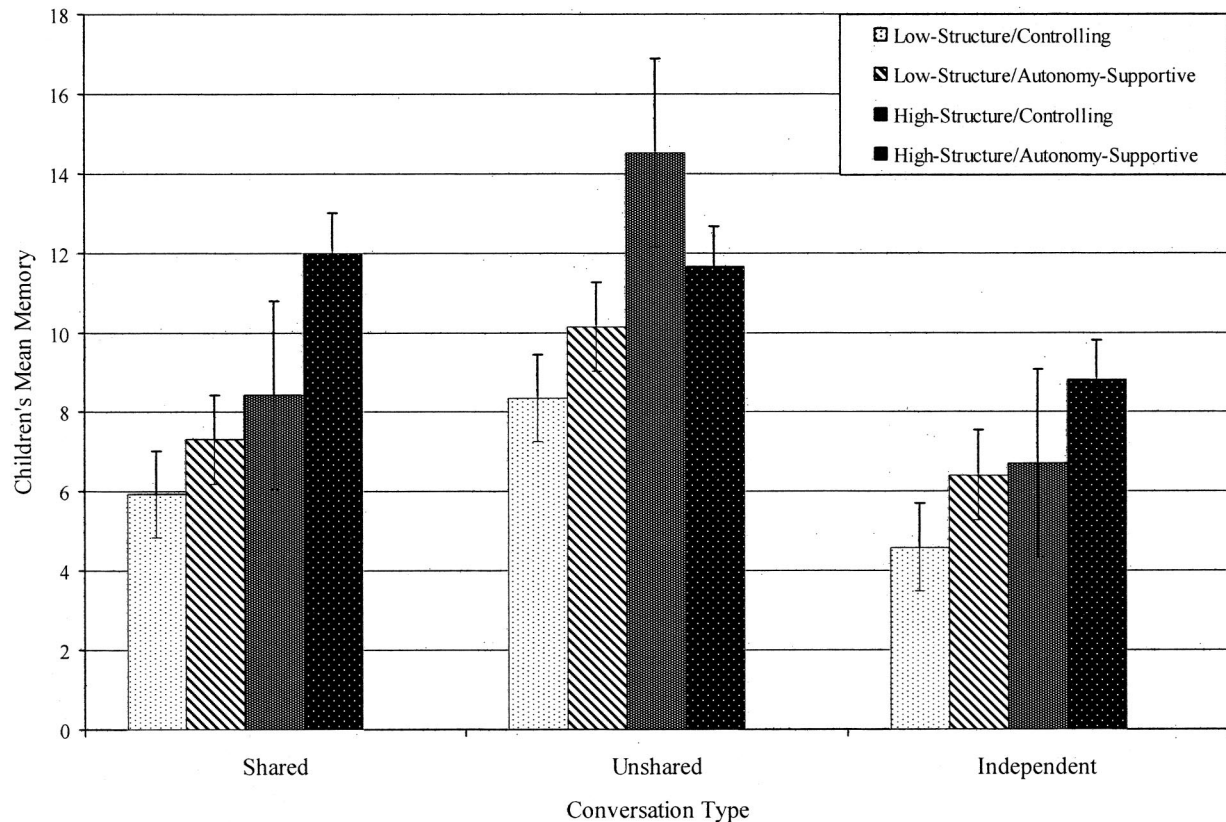


Figure 3. Children's mean memory per event at 65 months as a function of earlier maternal elaboration and autonomy support at 40 months.

children of mothers in any of the other three groups. Thus, these data support our prediction that children will provide the greatest memory when they have a mother who supplies both high structure and is autonomy supportive, and that children will provide the least memory when they have a mother who provides low structure and is controlling. At this young age, children seem to need both structural and motivational support to engage in collaborative reminiscing. Children's independent memory at this age was not a function of maternal style, but on the basis of past research with other samples (e.g., Reese et al., 1993), we would not have expected generalization of maternal style to children's independent reminiscing until age 5 or 6.

At 65 months, there were concurrent effects of maternal style for children's shared and independent memory. Children whose mothers provided high structure at 65 months, regardless of how autonomy supportive or controlling they were, provided more shared and independent memory at this time point than children whose mothers provided low structure and were autonomy supportive or controlling. Thus, it appears that by the time children are 5½ years old, mothers' open-ended elaborative questions about the past are linked with children's shared and independent reminiscing regardless of how autonomy supportive or controlling mothers are. Past research (cf. Haden et al., 1997; Reese et al., 1993) has suggested that children appear to internalize their mothers' structural style by the time they are 5 or 6 years old, and this seems to be the case for

maternal structure in the concurrent analyses regardless of how autonomy supportive a mother is. Results of the longitudinal analyses underscore the importance of mothers' elaborative questions at 65 months for children's memory at that same age, given that the effect of mothers' style at 40 months for children's memory at 65 months became marginal when we controlled for maternal style at the later time point.

Moreover, although the data at 65 months indicate a strong effect of maternal structure, with children in the two high-elaborative groups not differing from one another statistically, the pattern of the means is in the direction of children in the high-elaborative/controlling group providing more memory elaborations than children in the high-elaborative/autonomy-supportive group in both the unshared concurrent conversations and in the unshared long-term analyses. Although unshared events may, in some sense, become shared through joint reminiscing, mothers clearly will not have as much first-hand knowledge about those events that they did not personally experience. It may be that by 65 months of age, children are beginning to say more in response to a controlling mother when they know she did not experience the event under discussion.

Thus, there appear to be positive implications for children's memory of a maternal style characterized as high on both structure and autonomy support, at least early in the preschool years. Moreover, it appears that high structure in the form of open-ended elaborative questions has considerable implications for children's

shared and independent reminiscing by age 5½ regardless of how autonomy supportive or controlling a mother is. It is certainly possible that children play a role here; indeed, children may elicit a more or less elaborative maternal style depending on their own involvement in the conversations. These effects need to be verified experimentally, of course, before we can conclude that mothers' autonomy support and structure have additive effects on children's memory at either age. Other experimental work has verified the negative effect of a mother's controlling task orientation for children's performance (Gurland & Grolnick, 2003) and the positive effect of adult elaborations for children's memory (Boland et al., 2003; McGuigan & Salmon, 2004; Peterson et al., 1999), but we have yet to experimentally manipulate the added effects of autonomy support and structure for children's memory. Such a study might involve training mothers to ask open-ended elaborative questions and/or to follow in on children's event perspectives to isolate the effects of these different components of the high-elaborative reminiscing style at different ages and when mothers have different levels of knowledge about the event. Moreover, there was a great deal of variability in children's responding for these naturally occurring events. It would be worthwhile to test further the additive effects of structure and autonomy support in a more controlled setting in which all children experienced the same event (e.g., see McGuigan & Salmon, 2004, for such an event).

On the basis of these data, we can presume that the positive implications of the high-elaborative style for children's memory by age 5½ are largely due to the provision of elaborative structure in the form of open-ended elaborative questions. Parents who offer children information in the form of elaborative questions are giving children the necessary structure for personal remembering, with significant implications for children's independent reminiscing. A parent who is simultaneously supportive of the child's autonomy in reminiscing may be additionally fostering the child's interest and engagement in reminiscing; these children may be likely to get more involved in talking about the past early on in the preschool years. After children become more certain of their own perspective on an event, and more capable of providing memory independently, however, perhaps maternal autonomy support is less important than maternal structure in encouraging their memory.

In this respect, it is important to note that self-determination theory might predict that the effects of maternal autonomy support would be stronger for children's motivation to engage in reminiscing than for their competence in talking about the past. We would need to obtain measures of motivation for reminiscing, however, to test this hypothesis. For instance, perhaps maternal autonomy support affects children's willingness to bring up past events on their own in naturally occurring conversations or might ultimately affect the degree to which adolescents are interested in creating a coherent life story for themselves.

We do not know from these results how maternal warmth might also affect children's reminiscing or interact with the above effects for maternal structure and autonomy support.⁴ From the existing data we would predict that the effects of maternal warmth would be mediated through children's attachment security and would be primarily for children's emotional and evaluative responding during reminiscing and not for their overall memory in the conversations (e.g., Newcombe & Reese, 2004).

We did not measure the accuracy of children's memories in these conversations about naturally occurring events. For the purpose of eyewitness testimony, the accuracy of a memory is crucial. But for the purpose of compiling a life history, the accuracy of a memory may be less important. In these conversations about everyday past events, mothers and children had very few disagreements or even negotiations about what had occurred. Instead, the differences lay in the richness with which children were being introduced to reminiscing as a valued activity and in the degree to which children were allowed to put forth their own contributions to the conversations. A child who has a sense of ownership about his or her past, or who has a richly textured representation of that past, may be in a better position to construct an elaborated life history in middle childhood and adolescence (Nelson, 1996; McLean & Thorne, 2003).

Finally, it is worth considering that although some aspects of maternal behavior may be relatively task and context independent, other behaviors may reflect differential construals of the task and may therefore be relatively context dependent. Research demonstrates that mothers display relatively consistent structural styles in memory discourse across time and across siblings within a family (e.g., Haden, 1998), such that consistent individual stylistic differences in maternal elaboration are evident. However, as previously noted, there has been a relative dearth of attention in this type of research to maternal goals for shared reminiscing. It is reasonable to suppose that a mother's goals for shared reminiscing may vary with context, with implications for a mother's relative control or support of her child's autonomy in shared reminiscing across situational contexts. For example, the mother of a child who will later be tested for recall accuracy may have as a goal the child's veridical recall of a past event. On the other hand, the mother of a child who will not be tested may not share this goal but may instead desire to know the child's personal perspective on the past event. Indeed, in this latter case, a mother may be concerned that her child actively constructs a personal memory about the past event and may not believe that there is a "right" memory; in this case, a mother may be relatively supportive of her child's autonomy in reminiscing. In the former case, however, in which a mother may be principally concerned that her child remember the past event with relative veridicality, a mother may tend to be controlling in an effort to help the child get the memory "right." Thus, depending on her construal of the shared reminiscing task, a mother may focus to varying degrees on the process of remembering or on the outcome of remembering, with implications for her relative autonomy support or control in shared reminiscing. Ongoing research in our laboratory aims to determine whether being primed to the process of personal meaning making in memory co-construction leads mothers to be relatively supportive of children's autonomy in remembering compared with mothers who are primed to the outcome of a child's event recall.

⁴ In this study, children's attachment security at 19 months was weakly correlated with mothers' autonomy support in the shared context only ($r = .28, p < .05$) but was uncorrelated with overall autonomy support at either time point.

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Appendix

Excerpts From Conversations Grouped by Maternal Elaborations and Autonomy Support

Coding: 1 = controlling; 2 = moderately controlling; 3 = neutral; 4 = moderately autonomy supportive; 5 = autonomy supportive.

Low Elaborative and Controlling

Mother: Did Mummy wear ice-skating shoes? (3)

Child: Yep.

Mother: Did Daddy? No, don't put that in your mouth, you can't get it wet. Did Daddy wear ice-skating shoes? (2)

Child: Nah. Just wear his shoes.

Mother: Who fell over? (1)

Child: Who?

Mother: Who? (1)

Child: Who?

Mother: Who? (1)

Child: Who?

Mother: No one? (2)

Child: [Unintelligible name] fell.

Mother: And? (2)

Child: He cried.

Mother: He didn't cry. (1)

Child: He did.

Low Elaborative and Autonomy Supportive

Mother: Were there any cats? (3)

Child: Yeah.

Mother: Yeah? (3)

Child: And a we, we pat them.

Mother: Did ya? (3)

Child: Like that.

Mother: Nice and gentle. (4)

Child: Yes. But they didn't bite.

Mother: No? (3)

Child: Got, sharp all you hit them they, they do bite you.

Mother: That's right. If you hit them, if they hurt. (5)

Child: And you get scratched.

Mother: That's right. (5)

Child: But wh-, all your scratch that [unintelligible] could sore.

Mother: That's right, it would be sore. (5)

Child: Like this stretched like that.

Mother: The claws. Yeah. (5)

High Elaborative and Controlling

Mother: And what did we have to eat? What did we have to eat at Christmas dinner? We had str-. .? (2)

Child: Strawberries.

Mother: And? (2)

Child: Scream.

Mother: And cr-. .? (2)

Child: Cr.

Mother: Cream. (2)

Child: Mmm.

Mother: And what else did we have to eat? (2)

Child: Not more.

Mother: Yes we did. What did, did we have meat? Sit down please. (1)

Child: Ahh, I did, I did have meat.

Mother: We had meat and potato. (2)

Child: Mm.

Mother: What are those wee green things that come in a pod? P-. .? (2)

Child: I don't wanna talk to you anymore Mummy.

Mother: Peas. (1)

Child: Peas.

High Elaborative and Autonomy Supportive

Mother: And what else happened at the celebrations? (4)

Child: I don't know.

Mother: We did something special with all the other children. (4)

Child: What was it?

Mother: There was a whole lot of people over at the beach, and everyone was doing something in the sand. (4)

Child: What was it?

(Appendix continues)

Mother: Can't you remember what we did in the sand? We were looking for something. (3)

Child: Um, we had to um dig with the other end of the yellow bit one.

Child: Uh, I don't know.

Mother: That's right. We used the broken bit, didn't we? (4)

Mother: We went digging in the sand. (4)

Child: Umm, and that was when um the yellow spade broke.

Mother: Good girl, I'd forgotten that. Yes, the yellow spade broke, and what happened? (5)

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