# THE EFFECTS OF CONVERSATIONAL GOALS ON PARENT-CHILD MEMORY SHARING AND CHILDREN'S RECOLLECTIONS OF A STRESSFUL EVENT

By

Shengkai Sun

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Chairperson Dr. Andrea Greenhoot

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Dr. Evangelia Chrysikou

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Dr. Patricia Hawley

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The Thesis Committee for Shengkai Sun

certifies that this is the approved version of the following Thesis:

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Chairperson Dr. Andrea Greenhoot

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Abstract

This research examined how an emotion regulation goal, compared to a goal of remembering per se, affects the way parents guide conversations with their children about a negative event, and how these conversations impact children's independent memories for that event. Thirty-three 4- to 7-year-old children watched a short, mildly stressful video and then discussed it with a parent in one of two conditions: in the Fact-Focused (FF) condition ($n =17$), parents were asked to find out what happened, whereas in the Emotion-Focused (EE) condition ($n =16$) parents were instructed to help children regulate their feelings about the video. Shortly afterward, children were interviewed about their memories. We coded the content of parent-child conversations for references to several categories (e.g., emotions, facts, associative talk), and also assessed the accuracy and completeness of children's independent recall. Parents and children in the EF group made more references to emotions during the conversations than those in the FF group, but the two groups did not differ in other content categories. There were no group differences in children's memory performance, but parent emotion talk interacted with group in predicting child memory: in the FF group, parents' emotion talk was linked to poorer child memory across multiple indicators, but in the EF group it was unrelated or positively related to children's memory performance. Interestingly, parents who made more references to video facts had children who recalled less, but children's own fact talk predicted better memories. Also, children's emotional reactions and parent-child non-verbal interaction during the conversations predicted several parent conversation measures. These findings suggest that parents and children reciprocally influence each other in memory sharing. Discussion will address implications for understanding the transactional, dynamic nature of parent-child conversations and their influence on children's memories for negative events.

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The Effects of Conversational Goals on Parent-Child Memory Sharing and Children's

Recollections of a Stressful Event

The question of how well children can understand and recall past adverse experiences

has received considerable attention in psychological research, not only because of its scientific

value, but also due to its practical importance. For example, in the last two decades, increasing

numbers of children have been involved in legal proceedings as victims or witnesses,

highlighting the need to examine the factors that influence children's eyewitness reports of

traumatic experiences. Questions about memories for adverse events are also increasingly

important in clinical contexts; the way people remember negative past events is emerging as a

significant predictor of psychological outcomes (e.g., Ehlers & Clark, 2000; Greenhoot, Sun,

Bunnell, & Lindboe, in press; McLean & Pratt, 2006; Pennebaker, Mayne & Francis, 1997).

The literature on autobiographical memory development suggests that children's

skills and styles of remembering the past are significantly shaped by conversations about past

events with their parents (see Fivush, 2007, for a review). Most research in this literature has

focused on the links between parent-child joint reminiscing and child memory for positive events,

and there is less known about these relations in the context of distressing events. A few studies

have suggested that parents have different goals in guiding conversations about negative events

compared to positive ones, and one common goal in discussing negative events is emotion

regulation (e.g., Sales & Fivush, 2005). It has been proposed that an emotion regulation goal

leads parents to structure memory conversations in certain ways that facilitate children's

understanding and coping, and these conversational characteristics may have implications for

children's memories for the events that are being discussed. The current investigation was

designed to provide the first direct test of these hypotheses. Using an experimental paradigm, we

examined how an emotion regulation goal, compared to a goal of remembering per se, affects the way parents structure conversations with their children about a negative event, and how these conversations, in turn, shape children's independent recollections of that event.

**Child Memories for Negative Events**

Much of the interest in the question of how well children can remember past stressful and traumatic experiences stems from practical controversies surrounding the accuracy of children's eyewitness testimony as well as theoretical concerns about the relations between negative emotion and memory. Evidence from multiple sources has suggested that children recall most stressful and traumatic events quite well, even after extensive delays (e.g., Eth & Pynoos, 1994; Goodman et al., 2003; Malmquist, 1986; Sternberg, Lamb, & Hershkowitz, 1996; Terr, 1979, 1983). For example, Terr evaluated the memories of 25 elementary school children who were kidnapped from a school bus, and reported that the children were able to verbally recollect the trauma even four years after it happened (Terr, 1979, 1983). Similarly, children who experienced Hurricane Andrew when they were three to four years old provided quite detailed memories about the event both shortly afterward and six years later (Bahrick, Parker, Fivush, & Levitt, 1998; Fivush, Sales, Goldberg, Bahrick, & Parker, 2004). Not only do children recall public traumatic events quite well, their memories for personal stressful events are also quite robust (Howe, Courage, & Peterson, 1995; Merritt, Ornstein, & Spicker, 1994; Ornstein et al., 2006; Peterson, 1999; Peterson & Whalen, 2001; Quas et al., 1999). For example, children recollect an average of 75% of the details of injuries requiring emergency room treatment when interviewed a week after the event, and showed little forgetting even two and five years later (Peterson, 1999; Peterson & Whalen, 2001).

Research on children's memories for stressful events has also identified several

factors that predict this type of memories. Children's memory for stressful events is related to several well-established predictors of ordinary memory (e.g. Greenhoot, McCloskey, & Glisky, 2005). For example, older children provide more detailed and complete recollections of past stressful events than younger children (e.g., Alexander et al., 2005; Howe, Courage, & Peterson, 1994; Ghetti, Goodman, Eisen, Qin, & Davis, 2002; Lamb et al., 2003; Orbach, Hershkowitz, Lamb, Esplin, & Horowitz, 2000). Also, event centrality, saliency and repetition all seem to predict children's memories for negative events in the same ways as they are related to memories for non-negative events. Specifically, children remember central elements of past stressful experiences better than peripheral details (e.g., Howe et al., 1994; Peterson & Whalen, 2001). Negative events that are more salient are better remembered than those that are less salient (e.g., Peterson & Whalen, 2001). Finally, children tend to remember more details of negative events that infrequently occur and blend together details of events with multiple similar episodes (e.g., Johnson, Greenhoot, Glisky, & McCloskey, 2005; Peterson & Whalen, 2001).

Children's memories for negative events also vary with the level of stress experienced, although a variety of patterns have been reported in the literature (e.g., Bahrick et al., 1998; Merritt et al., 1994; Peterson & Biggs, 1998; Peterson & Whale, 2001; Quas, Bauer, & Boyce, 2004; Quas & Lench, 2007; Sales, Fivush, Parker, & Bahrick, 2005; Salmon, Price, & KieranPereira, 2002). Some evidence shows that child stress predicts better memory performance (e.g., Alexander et al., 2002; Peterson & Whale, 2001; Quas & Lench, 2007), whereas other points to a negative association between stress and memory (e.g., Merritt et al., 1994; Quas & Lench, 2007; Salmon et al., 2002). The variation in these findings can be attributable to a variety of factors such as the nature of events and how children's stress and memories were measured (Gordon, Baker-Ward, & Ornstein, 2001). Also, in much work on this

topic, children's memories were typically obtained after quite long delays ranging from a few days to several years, thus another factor that must be taken into account when evaluating the effect of stress on memory is how well children's stress is coped with through interactions with adults during the delays. A growing body of work suggests that children's memories for stressful events could be shaped by the way in which parents talk with them about the events. In particular, because young children lack the ability to understand and cope with negative experiences, parent-guided discussion about such experiences may shape children's memories in ways that facilitate understanding and reduce stress (e.g., Laible & Song 2006; Shipman et al. 2007; Thompson, 2006; Van Bergen, Salmon, Dadds, & Allen, 2009). We turn to the literature on the role of parent-child conversations in children's autobiographical memory in the next section.

**Parent-Child Conversation and Child Event Memory**

Research in the memory development literature has shown that an important context in which young children learn how to construct coherent and meaningful autobiographical narratives is parent-child joint reminiscing about past events (Fivush et al., 2011; Reese & Fivush, 2008; Wareham & Salmon, 2006). Research on this topic suggests that parent reminiscing style has enduring impact on children's event memory skills (Fivush, 2007). A great number of studies have shown that parents differ in reminiscing style: some parents are highly elaborative, providing much information as well as asking many questions that elicit new information from children; whereas other parents are less elaborative, asking repetitive questions and rarely providing new information (e.g., Fivush, 1988; Fivush, Reese, & Haden, 2006; Hudson, 1990; Nelson & Fivush, 2004). It has been consistently shown that these individual differences are associated with children's memory skills. Specifically, compared to children of repetitive parents, children of highly elaborative parents are more elaborative when sharing

personal memories, both conversing with their parents and other people (e.g., Haden, Haine, & Fivush, 1997; Harley & Reese, 1999; Peterson, Jesso, & McCabe, 1999; Reese & Newcombe, 2007). For example, Harley and Reese (1999) assessed mothers' style of talking as they were reminiscing with their19-month-old children about shared past events; mothers who were classified as having a highly elaborative style had children who recalled more information about different events with a researcher almost a year later. Evidence for a causal relationship between parent style and children's memory development comes from an intervention study by Reese and Newcombe (2007). Mothers participated in an elaborative reminiscing training program when their children were 1.5 to 2.5 years of age; children of trained mothers later provided richer memories about past events when interviewed by a researcher than children of untrained mothers a year later, although this effect also depended on children's self-awareness.

Furthermore, parents who tend to elaborate on certain aspects of past events with children have children who come to elaborate on those same aspects when sharing memories with others. Peterson et al. (1999) showed that mothers who were taught to elaborate more on context during reminiscing with their children had children who provided more spatial-temporal information in their independent narratives about other events 2 years later. Haden and her colleagues (1997) also reported that mothers who provided more evaluative information in joint reminiscing when their children were 40 months old had children who included more of this type of information in their narratives about different events with an unfamiliar adult a year and two years later. It seems that by elaborating on certain aspects of an event, parents are teaching their children what information about the past is important to remember and to tell others.

The way that parents talk with children about past experiences does not just influence children's developing memory skills; it also appears to have more specific effects on how well

children remember the events that are being discussed. Studies on this topic typically have parents and children talk about an event that was well-documented and then assessed children's memories for that event in relations to the content of the parent-child conversations. This body of work shows that both the style and content of parent-guided memory talk have implications for children's independent recall of discussed events (e.g., Boland, Haden, & Ornstein, 2003; Bauer, Burch, Van Abbema, & Ackil, 2007; Bauer et al., 2005; Cleveland, Reese, & Grolnick, 2007; Haden, Ornstein, Eckerman, & Didow, 2001; Leichtman, Pillemer, Wang, Koreishi, & Han, 2000; Low & Durkin, 2001). For example, in Cleveland et al.'s study (2007), preschool children experienced a "pretend zoo" visit and later talked about it with their parents; children of parents who engaged in more elaborative talk provided richer and more coherent memories of the event two weeks later. Leitchman et al. (2000) had parents talk with their children (4- to 5-year-olds) about a special event at school – the visit of the children's former teacher and her new baby. Children of more elaborative parents provided more accurate information about the event with a researcher three weeks later; moreover, children remembered features of the event that were discussed during the conversations better than those that were not mentioned. Conversations that take place during an event have similar influences on what children remember. For instance, Haden et al. (2001) observed mother-child conversations during specially constructed activities (e.g., pretend camp trip) when children were 30, 36, and 42 months of age, and assessed their1-day and 3-week recall of these activities; at all age points, details of the activities that were jointly handled and talked about were better recalled by children.

Most research examining the effects of parent-child conversations on children's recall of discussed events has relied on recollection of neutral and positive events, partly because these events are easier to document for objective memory assessment; less is known about how adult-

child talk influences children's memories of distressing events. Numerous studies have shown that stressful events seem to be particularly well remembered by children (e.g., Bahrick et al., 1998; Fivush et al. 2004; Peterson, 1999; Peterson, Sales, Rees, & Fivush, 2007), thus it is possible that these memories are so salient in themselves that parents-child talk has little further impact. This hypothesis, however, was not supported by a recent study of Peterson et al. (2007). In their work, 2- to 5-year-old children's recall of an injury requiring emergency room treatment were assessed both within a few days of injury and 2 years later, along with the way parents reminisced with them about the injury and hospital visit. Parents who were more elaborative had children who recalled more unique, accurate details about the well-documented hospital procedures. This finding suggests that parental talking style affects children's recall of even highly stressful events, although more studies are needed to further confirm this pattern.

In addition to parental style of talking, another aspect of parent-child conversations that may play an important role in children's recall of stressful events is the emotional content. Considerable research has shown that parent-child reminiscing about negative events is more emotionally expressive and coherent than that about non-negative events (e.g., Ackil, Van Abbema, & Bauer, 2003; Fivush et al. 2003; Sales & Fivush, 2005; Sales, Fivush & Perterson, 2003; Wang & Fivush, 2005). For instance, Ackil et al. (2003) asked 2.5 to 12 years old children and their mothers to talk about a tornado that had destroyed their town both 4 and 10 months after its occurrence. Both the 4-month and 10-month tornado conversations contained more mention of emotion and cognition terms, than conversations about pre- and post-tornado non-traumatic events, even when controlling for the fact that tornado conversations were longer. Similar findings were documented in Sales et al.'s (2003) analyses of parent-child conversations about a traumatic injury requiring emergency room treatment and a positive event. They assessed

parents and children's (2 to 5-year-old) contributions separately, and found that both parents and children talked more about causes and consequences in the trauma conversations than in the positive event conversations. This pattern was observed in conversations that took place shortly after the ER visit as well as two and a half years later. Different content in positive and negative event conversations may reflect different internal goals of the parents: whereas reminiscing about positive events is often aimed at maintaining and strengthening social bonds with children, talking about negative events typically serves the purpose of helping children understand and resolve negative feelings evoked by the events. One of the purposes of the current study was to directly test this hypothesis by observing how parent-child conversations about a stressful event differ according to parental goal.

The extent to which parent-child memory sharing is oriented toward emotion regulation may have implications for children's memory for the discussed event. Compared to parents who simply focus on figuring out what happened, parents who aim to facilitate coping and understanding in children may elaborate less on event details but discuss more emotions and causal explanations, and these characteristics may have two possible effects on children's memory for the event. First, enhanced emotion talk may impair children's recall of event details if it leads to reductions in fact-oriented talk. It is well known that children remember previously discussed information better than information that has never been talked about (e.g., Leitchman et al. 2000, Cleveland, 2007; Roediger & Butler, 2011), thus less talk about event details may lead to poorer memory. Also, increased emotion talk may remind children of the stress that they previously experienced, thus may impair retrieval (e.g., Nathanson & Saywitz, 2003; Quas & Lench, 2007). However, an alternative possibility regarding the effects of emotion-focused conversation on child memory is that discussing emotions may enhance recall; by talking about

children's feelings associated with an event, parents may make the event more meaningful, relevant, and thus more memorable to children (e.g., Alexander et al., 2002; Peterson & Whale, 2001; Quas & Lench, 2007).

The latter hypothesis regarding the relationship between emotion talk and child memory was consistent with Van Bergen and Salmon's (2010) work. In their study, 3- to 6-year-old children watched a staged "visit to the zoo" event in which a female researcher acted a "zookeeper". Two days after that, the "zookeeper" reminisced with children about the show in four conditions: emotion-cause focused, emotion-expression focused, no-emotion focused, and low-elaborative control condition. Two weeks later, another researcher interviewed children about the show. Children who were in the emotion-focused groups, particularly those in the emotion-cause focused group, recalled more emotional as well as non-emotional information than did children whose reminiscing included no emotional content or those in the low-elaborative control condition. This finding suggests that talking about emotion may help children pull different aspects and details of an event together as a coherent and meaningful whole, thus may have a global enhancing effect on children's event memory over and above the effects of elaborative fact talk. However, it is unknown whether emotion talk would have similar effect on children's memory for distressing events. Therefore, another goal of this study was to examine the effect of emotion talk, as compared to fact-oriented talk, on children's memories for a distressing event.

Research on parent-child event memory sharing suggests that such conversations might also vary as a function of several parent and child individual difference variables (Reese 2002; Fivush et al., 2011; Sales & Fivush, 2005). For example, a few studies have shown the way parents discourse with children about the past may depend on several child-related factors such

as age, gender and temperament. Lewis (1999) showed that mothers were more repetitive and used more evaluation in conversations with younger children than with older ones. Also, parents tend to elaborate more, talk more about emotion when conversing with daughters than with sons (e.g., Reese & Fivush, 1993). Child temperament is another predictor of maternal reminiscing style (e.g., Lewis, 1999; Laible, 2004). For instance, Laible (2004) examined the relations between maternal narrative styles and 3- to 5-year-old children's temperaments, and found that mothers were less repetitive with a child that they perceived as sociable.

Another factor that has been intensively examined in relations to parent-child memory talk is attachment. It has been proposed that joint reminiscing is an important part of the attachment relationship during the toddler and preschool years, and discourse between secure children and mothers is more emotionally open, elaborative, and coherent than memory sharing between insecurely attached dyads (Bost et al. 2006; Fivush & Sales, 2006; Fivush and Vasudeve, 2002; Laible, 2004, 2011; Laible & Thompson, 1998; Mcquaid et al. 2007; Reese, 2002; Waters et al. 2010). For example, Mcquaid et al. (2007) showed that, compared to mothers of insecurely attached children, mothers of securely attached children used more mental state language in parent-child conversations about emotional salient events. Laible (2011) also reported that attachment security were associated with high levels of maternal elaboration; furthermore, mothers with securely attached children discussed causes of emotion more than mothers of insecurely attached children in negative event reminiscing conversations. We proposed that children's verbal and non-verbal responses during the conversations would also relate to parents' talk. Therefore, in the current study another objective was to explore these individual factors that contribute to the variation in parent-child conversations.

Coming to a better understanding of the factors that influence children's memories for past stressful and traumatic events, particularly the role of parent-child interactions, has several scientific and practical implications. Parent-guided reminiscing about past negative experiences with a goal of emotion regulation is quite often, and we proposed that such a goal and the way in which parents structure these conversations relate to children's later recall. Understanding these links can be helpful in solving a number of practical problems such as determining how well children can report eye-witness testimony, and the extent to which children can remember past adverse events in ways that promote adjustment. Although we have known much about the role of parent-guided talk in children's memory for non-stressful events, the relations in the context of distressing events still need further exploration.

**Present Study**

The current investigation expands on previous work in several ways. First of all, previous work has suggested that different ways in which parents reminisce with children about negative and non-negative events reflect different underlying goals (e.g., Ackil, et al., 2003; Fivush et al. 2003; Sales & Fivush, 2005; Wang & Fivush, 2005), but no study has directly tested this hypothesis. In the current investigation, we addressed this question by randomly assigning parents to either an emotion regulation goal (Emotion-Focused or EF condition) or a remembering goal (Fact-Focused or FF condition) to talk with their children about a past event (a mildly stressful video that children watched in the lab), and then examining whether parents in these two groups differ in the way that they guide the conversations. Based on the existing work on parent-child conversations about stressful events (e.g. Ackil, et al., 2003), we expected that parents in the EF group who were instructed to have the emotion regulation goal would engage

in more emotion discussion but less talk about the factual details of the video compared to parents in the FF group.

We also expected the variations in parent-child talk to lead to differences in the way children remember the video. Although considerable work has examined how parent-child reminiscing about non-negative events affects child memory, little work has evaluated these relations in the context of discoursing and remembering past stressful events. Thus, another way in which the current study extends prior research involved examining how both conversation condition (emotion versus fact focus) and individual differences in conversation content within group (e.g., emotions, video facts, off-topic talk) might relate to the accuracy and completeness of children's later independent recollections. We proposed two possible effects of condition on children's memory performance. One was that children in the FF group would outperform those in the EF group, if focusing on emotions in the EF condition leads to less discussion about video facts. Alternatively, children in the EF group would have better memories because talking about emotions might make the video more meaningful and memorable. Similarly, we hypothesized two potential relations between individual differences in emotion talk within group and child memory; discussing emotions could enhance or impair children's recall. To our knowledge, this is the first examination of how emotion-oriented talk that is common in parent-child discourse about past negative events (e.g., Fivush et al., 2006, Wareham & Salmon, 2006) influences children's memories of those events. We also predicted that parents and children's references to factual details of the video during the conversations would lead to better memories.

A third aim of this study was to explore individual and developmental factors that contribute to the variation in child memory performance and parent-child conversations. In addition to influences associated with parent-guided conversations, we predicted that children's

memories of the video would also depend on several other factors such as child age and vocabulary. According to the basic child memory literature (e.g., Alexander et al., 2005; Howe et al., 1994; Lamb et al., 2003), we expected that older children and children who had higher level of vocabulary would provide more accurate and complete memories of the video in the interviews. Parent contribution to the conversation would also be affected by a number of factors other than instruction type. For example, based on previous research findings (Fivush & Vasudeva, 2002; Laible, 2004, 2011; Waters et al. 2010; Mcquaid et al. 2007; Fivush & Sales 2006; Garrett-Peters, 2008; bost et al. 2006), we predicted that parents and children who had more secure relationship would have longer conversations with more discussion about emotions; also, parents were predicted to guide more emotionally expressive discourse with girls than with boys. One limitation of the current body of research is that the role that children play during the parent-child joint reminiscing has not been adequately explored. Thus, the final way in which the current study expands on the existing literature is via examining whether children's reactions and responses during the conversations predicted the way parents guided the discourse. We expected that parents with children who displayed more distress evoked by the video would have less talk directly about the video, and increased off-topic and emotion talk for the purpose of reducing negative feelings.

**Methods**

**Participants**

Parent-child dyads were recruited via flyers distributed in the school system and throughout the community in the Lawrence, KS area. Only one child was recruited per family to minimize the impact of parental knowledge about the film on children's memories. A total of thirty-five typically developing children and their parents participated, but data collected from

two dyads were dropped from final analyses because the children resisted following the

instructions and failed to complete multiple measures. In the final sample ($N = 33$), there were 15

girls and 18 boys who ranged in age from 45 months to 93 months ($M = 67.73$, $SD = 13.18$). In

terms of children's races, most (70%) of them were white, 18% were African-American, 6%

were Asian American, and 6% were of other ethnicities. Most of the parents (82%) had at least

some college education, with 6% of them having only partial high school education. About half

(48%) of the parents reported an annual family income lower than \$40,000, and 12% reported

above \$100'000. These demographics represent the population of families living in the small

university town in which the study was conducted. Most of the dyads were mother-child pairs,

with only one father-child dyad. All dyads spoke fluent English. Participants assigned to the two

experimental conditions (see **Parent-child conversation** below) did not differ in any of these

demographic measures.

**Procedure[1]**

Upon arrival to the lab, parents were given a consent form to read and sign. After

establishing rapport with the children (e.g., introducing each other), the experimenter explained

the study to the children and obtained their verbal consent. A 15-minute play period then

followed during which parents were asked to play some small games (e.g., puzzles) with their

children as naturally as possible. These activities were expected to be able to alleviate children's

anxiety and stress elicited by the new lab environment. Next, children watched a mildly stressful

video (described below in **Video**) in the testing room with the experimenter, while their parents

were waiting in an area outside the room. After children finished watching the video, parents

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[1] The data for this study were a subset collected for a larger project in which children's physiological reactions were also measured. Only the procedures that are pertinent to the current investigation are described.

went back to the testing room, and were given one of two instructions (see **Parent-child conversation** below) to talk about the video with their children for 10 minutes. In the last stage, parents were asked to fill out a demographic questionnaire as well as two relationship questionnaires in the waiting area. Meanwhile, children completed a vocabulary test and a verbal questionnaire about their relationship with the parents. Finally, children participated in a memory interview in which the experimenter asked about what happened in the video according to a standard protocol (see **Child memory interview** below). In the end, parents were paid $25 and children were given small toys for participation. Parent-child conversions and experimenter-child memory interviews were all video-recorded for transcribing and coding. The Human Subjects Committee in Lawrence approved all the experiment procedures, which are summarized in Figure 1.

       **Video.** This 13-min video was designed to elicit mild stress in children and was selected on the basis of its emotional content and developmental appropriateness. Similar videos have been used in prior studies on the physiological stress responses in children (e.g., Quas, 2007, Alkon et al., 2003). The video consisted of scenes from a G-rated animated Disney movie, "The Rescuers" (1977). The video depicted the story of a cruel woman (named Medusa) forcing a young girl (named Penny) to go down into a dark cave to find a diamond. Based on parents' report, most children (91%) and parents themselves (67%) were unfamiliar with the film prior to the study. Before the actual data collection, this video was shown to several preschool children informally, and most of them reported it to be "scary" to some extent. In order to create a guiding structure for the experimenter-child interview as well as to facilitate later coding and data analyses, the video was divided into 19 key events that occurred sequentially, each of which featured two gist actions (see Appendix A).

**Parent-child conversation.** After children finished watching the video, parents were given either the Fact-Focused (FF) or the Emotion-Focused (EF) conversation instruction that suggests an emotion regulation goal or a goal of remembering per se, respectively. In the FF condition, parents were instructed to find out what the child thought happened in the video and help the child understand it. In the EF condition, parents were asked to find out what the child felt about the video, and make sure that the child "feels all right about it". For full instructions, see Appendix B.

**Child memory interview.** The memory interview took place about 15 to 20 minutes after the child-parent conversation depending on how quickly the child completed the other tasks (e.g., vocabulary test).  The interview started with a free-recall phase followed by a directed recall stage. The free-recall questions were constructed in a way that oriented children to recall the events in the video sequentially. The experimenter first introduced the topic by telling the child "I forget what the film was about because I wasn't paying much attention when I was watching it. Can you tell me what happened in it? Let's start from the beginning. What happened at the beginning of the video?" While the child was responding, the experimenter checked on an interview checklist (see Appendix A) to record what events had been mentioned and what had not. If the child skipped any event, the interviewer asked an open-ended question about it by directing the child to the just previous event (e.g., "What happened after _?"). Children were also asked to provide more information about any event recalled but not fully elaborated  (e.g, "How did __ happen?"). This free recall section ended with a general follow-up prompt (e.g., "Is there anything else you can tell me about the video?"). In the directed recall phase, the experimenter asked children to recall specific key events that had not been mentioned (e.g., "What happened when Penny was trying to get the diamond?")

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            Parent                              Child

              ↓                                  ↓
        ┌──────────────────────────────────────────┐
        │            Playing Period                 │
        │              [15 min]                     │
        └──────────────────────────────────────────┘
              ↓                                  ↓
   ┌──────────────────────┐        ┌──────────────────────┐
   │   Waiting outside     │        │    Watching video     │
   │                       │        │       [13 min]        │
   └──────────────────────┘        └──────────────────────┘
              ↓                                  ↓
        ┌──────────────────────────────────────────┐
        │     Memory conversation about video       │
        │                [10 min]                   │
        └──────────────────────────────────────────┘
              ↓                                  ↓
   ┌──────────────────────┐        ┌──────────────────────┐
   │                       │        │    Vocabulary test    │
   │                       │        │ Relationship Questionnaire │
   │                       │        │  [15 - 20 min total]  │
   │ Completing            │        └──────────────────────┘
   │ Questionanires        │                    ↓
   │ outside               │        ┌──────────────────────┐
   │                       │        │   Memory interview    │
   │                       │        │   [5min - 10min]      │
   └──────────────────────┘        └──────────────────────┘
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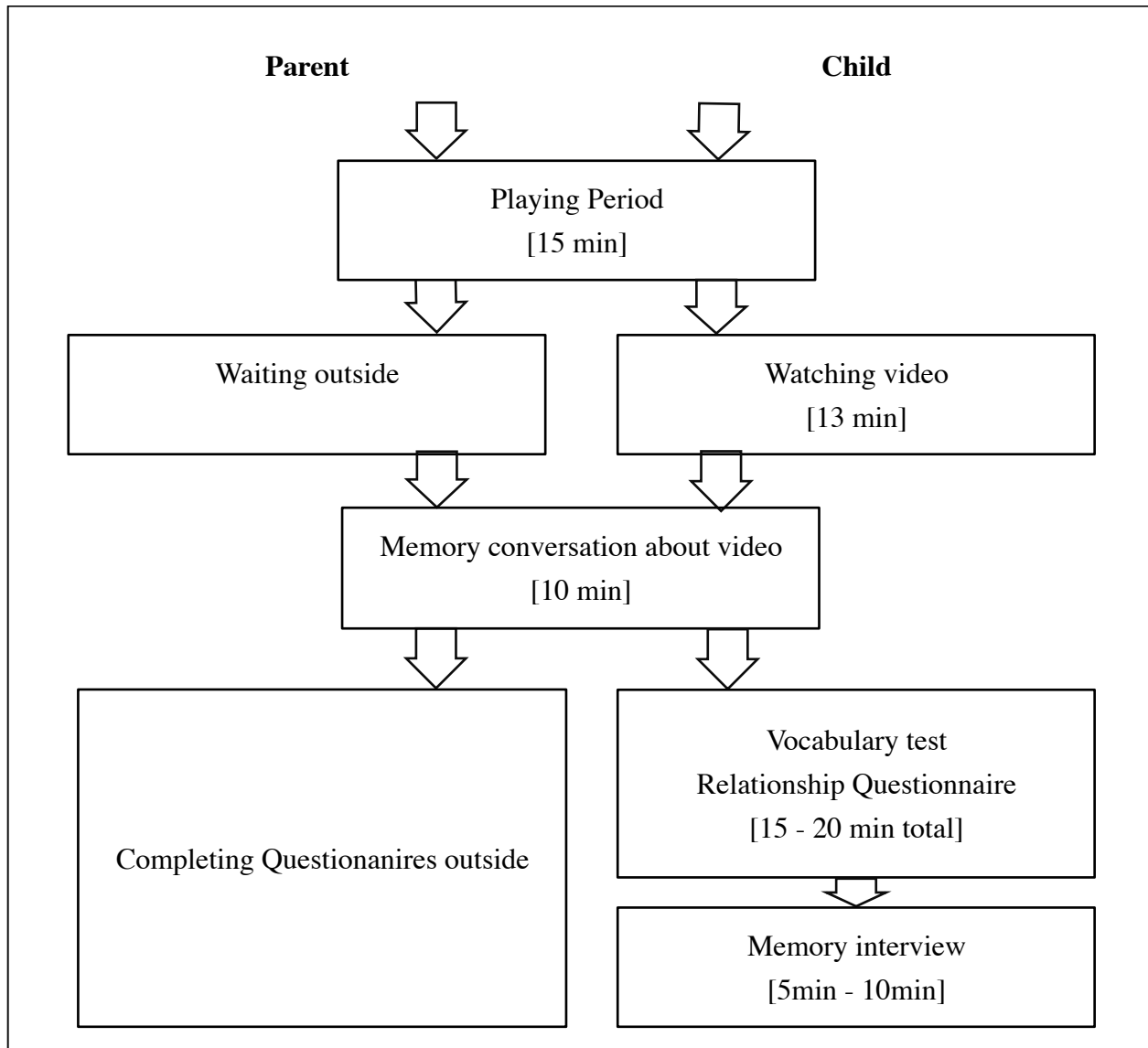
*Figure 1.* Experiment procedures.

**Child emotional reactions.** Children's emotional reactions were assessed by several measures. First of all, children completed an age-appropriate mood scale at three times during the experiment: before the video, after the video and after the parent-child conversation. Each time children were asked to indicate their current mood by pointing to one of the five symbolic faces that indicated five levels of mood: very unhappy, a little unhappy, so-so, a little happy and very happy (see Appendix C). In the last phase of the study, parents also rated how upset they

thought their children felt about the video during the conversation on a 5-point scale (see

***Demographic and reaction questionnaire*** below). Finally, we also coded children's nonverbal

indications of positive and negative affect during the videotaped conversations (see **Coding**

below).

**Individual difference and demographic measures.**

***Child language.*** Child language skill was assessed by the third edition of the Peabody

Picture Vocabulary Test (PPVT-III; Dunn & Dunn, 1997). The PPVT-III is a well-established

measure of receptive vocabulary skills, standardized for use with 2 ½-year-olds through adults.

Internal consistency estimates range from .67 to .88. Because we were interested in

developmental changes, we used raw scores instead of age-equivalent scores. In our sample,

children's scores on this vocabulary test ranged from 30 to 139 ($M = 85.39$, $SD = 29.03$), and

they did not differ between the two groups.

***Relationship scales.*** We assessed both parents' and children's relationship styles. For

parents, two attachment questionnaires (see Appendix D) were used: the Relationship

Questionnaire (RQ; Bartholomew & Horowitz, 1991) and the Relationship Scales Questionnaire

(RSQ; Griffin & Bartholomew, 1994). For the Relationship Questionnaire, parents rated the

similarity of their current relationship style to each of four attachment styles: Secure,

Preoccupied, Dismissing, and Fearful. Ratings are made on 7-point Likert scales (1 = not at all

like me, 7 = very much like me). For the Relationship Scale Questionnaire, parents rated their

level of agreement (5-point scale; 1 = not at all like me, 5 = very much like me) with 30

statements concerning close relationship styles. The means for items corresponding to the same

four attachment styles were calculated (Griffin & Bartholomew, 1994). The internal consistency

of the subscales of RSQ ranges from .75 to .79, and the measure shows moderate stability over

an 8-month period (Scharfe & Bartholomew, 1994). Scores on the four attachment styles from the RQ and RSQ were highly correlated, indicating high measurement reliability ($rs \geq .49$, $p \leq .0040$), thus only scores from one questionnaire (RSQ) were used in data analyses. No group difference in this measure was found.

To assess children's attachment styles, we used a questionnaire (see Appendix D) that was adapted from Lynch and Cicchetti (1997). This measure contains 16 statements concerning the relationship between children and parents (e.g., "When I'm with my mom, I feel she ignores me.") To make the questions more understandable for children aged from 4 to 7 years, we revised some relatively difficult words in the original questions (e.g., "relaxed" was substituted with "easy and comfortable"). We also changed the original 4-point Likert scale to a pictorial scale represented by four increasingly large dots. This questionnaire yields two subscales: the emotional quality scale consists of items that assess children's positive or negative emotions when they are with the parent; and the psychological proximity seeking scale consists of items that assess the degree to which children wish they are psychologically closer to the parent. Based on their scores on these two subscales, children are classified as having one of five patterns of relationship with their parents, namely optimal, adequate, deprived, disengaged, and confused. Optimal and adequate relationship styles are further classified as secure relationship and the others indicate insecure relationship. Based on children's scores on this measure, the majority of them (85%) were classified as having a deprived or confused relationship (insecure attachment) with their parents. This finding is surprising given that this is a normative sample, and may indicate that the children in the age range of 4 to 7 did not understand the questionnaire very well. Therefore, the scores yielded by this measurement were not used in data analyses, and will not be discussed further.

***Demographic and reaction questionnaire.*** The first part of this parent-completed

questionnaire included questions about demographic characteristics (e.g., child gender and

ethnicity, parent education, family income), and other background information that could be

relevant to the study (e.g., the parent's prior knowledge about the film). The remaining part of

this questionnaire asked parents to rate on children's emotional reactions and memories of the

video, as well as their own knowledge about the video after talking with the children (see

Appendix E).

**Coding.** Both the verbal and non-verbal interaction during the conversation and

children's independent recollection of the video in the memory interview were coded for several

dimensions. Because some of the codes were scored at the proposition level, the videos of the

parent-child conversations and the child memory interviews were first transcribed verbatim and

divided into propositions. A proposition was defined as an idea unit that is typically

characterized by a subject-verb structure.

***Parent-child conversation.*** We coded parents and children's utterances separately for

references to multiple content categories – Character Appearances, Other Facts, negative and

non-negative Emotions, Character Feelings, Judgments, Other Associative Talk, and Off-Topic

Talk. Each proposition was only assigned one of these mutually exclusive codes. For

descriptions and examples of the full set of codes, see Appendix F. References to Character

Feelings were extremely rare (the average numbers were 1.76 and 1.48 for parent and child

contributions, respectively), thus this code was not included in our data analyses and will not be

further discussed. To reduce the number of variables in the analyses, we summed the numbers of

references to Appearances and Other Facts as an overall index of references to Facts. A master

coder coded all the transcripts and an additional coder independently coded 20% of the

transcripts for purposes of calculation of reliability. The Pearson product moment correlations between the two coders' scores ranged from .91 to .99 across categories, indicating high coding reliabilities. Only the master coder's scores were used in the data analyses.

*Parent-child nonverbal interaction.* We also coded the qualities of parent-child non-verbal interaction based on the conversation videos. We first segmented each video into several one-minute intervals, and then scored each interval for multiple dimensions on $0 - 2$ three-point scales. Parent Engagement assessed the degree to which parents showed attention and interest to children's talk. Parent Interruption captured the degree to which parents were autonomy-supportive, with lower interruption indicating higher level of autonomy-support. Parent Warmth and Mutual Eye Contact were scored to indicate the relationship between parents and children, with higher scores on either dimension indexing closer relationship. Child Positive and Negative Affect were coded as behavioral indicators of children's emotional reactions during the conversations. The full set of nonverbal codes with descriptions and examples are summarized in Appendix G. Because all the conversation videos were 9 to 10 minutes long, we only coded the first nine intervals, and used the average scores across these segments as individual scores. A master coder and two additional coders coded the videos, with the master coder coding all the videos, and each of the additional coders independently coding 20% of the videos. Overall percent agreement on the codes ranged from 92% to 94% and averaged 93%.

*Child memory.* First, we marked propositions in the interview transcripts that were repeating or unrelated to the video; and these propositions were not coded. After that, each of the remaining propositions was matched up with a key event according to the content (see Appendix A for the key events). If both the featured actions of a key event were accurately reported, the report of that event was further judged "accurate and complete" (see Appendix A for featured

actions of each event). The overall number of reported events and the number of events accurately and completely recalled were highly correlated, $r = .80$, $p < .0001$, thus we only used the overall number of reported events (out of 19) in data analyses as an indicator of memory completeness. We also identified the total number of key objects and characters remembered as an index of the number of "items" depicted in the video that children recalled. In order to index the details and accuracy of children's memories for the events, we counted the total number of propositions, the number of propositions that were accurate, and also calculated the proportion of the total propositions that were accurate (i.e., memory accuracy score).

One coder coded all the transcripts and another coder independently completed 20% of all the transcripts for reliability purposes. The Pearson product moment correlations between the two coders' scores were above 0.96 for all variables, indicating high coding reliabilities. Disagreements were discussed and the resolved scores were used in data analyses.

## Results

### Descriptive Analyses

**Parent-child conversational measures.** Table 1 shows the means and standard deviations for parents and children's conversational measures broken down by group and for the total sample. Not surprisingly, parents and children in the EF group had more emotion talk, both negative and non-negative, than those in the FF group, $ts(31) \geq 2.40$, $ps \leq .023$. However, the two groups did not differ in other conversational content categories (e.g., Facts) or in the total amount of talk as measured by the number of words. These data also revealed that Facts (i.e., the factual information about the video that was not inferred) was the most frequently discussed category in parent-child conversations: the average proportion of total propositions that were coded as Facts was 56% and 44% for parent and child contribution, respectively. Interestingly,

children referred to more positive or neutral emotions than negative emotions in both the FF

group, $t(16) = 3.63$, $p = .0022$, the EF group, $t(15) = 2.52$, $p = .024$, and across the total sample,

$t(32) = 3.42$, $p = .0017$; in contrast, parents had relatively equal amounts of negative and non-

negative emotion talk. No gender differences in these conversational measures were found.

Table 1

*Parent and Child Conversation Measures by Group and for Total Sample*

| Measures | FF Group *M(SD)* | EF Group *M(SD)* | Overall *M(SD)* |
|---|---|---|---|
| **Panel 1. Parent Contribution** | | | |
| Facts | 59.00(28.11) | 49.56(34.27) | 54.42(31.12) |
| Emotions*** | **5.00 (4.76)** | **17.38(12.63)** | 11.00(11.20) |
|   Negative** | **2.41(2.62)** | **7.63(6.83)** | 4.94(5.68) |
|   Positive/Neutral*** | **2.59 (2.43)** | **9.75 (7.48)** | 6.06 (6.51) |
| Judgments | 5.59(4.70) | 4.44 (3.67) | 5.03(4.21) |
| Other associative talk | 12.35(9.37) | 17.75(19.14) | 14.97(14.94) |
| Off-topic talk | 23.65(18.93) | 23.50(24.80) | 23.58(21.62) |
| Word Count | 605.12(228.92) | 651.13(217.62) | 627.42(221.24) |
| **Panel 2. Child Contribution** | | | |
| Facts | 68.35(30.98) | 69.56(39.95) | 68.94(35.05) |
| Emotions*** | **3.06(3.58)** | **9.56(5.91)** | 6.21(5.80) |
|   Negative* | **0.76(1.30)** | **2.94(3.49)** | 1.82(2.79) |
|   Positive/Neutral** | **2.29 (2.49)** | **6.63 (4.73)** | 4.39 (4.29) |
| Judgments | 3.82(2.60) | 5.69(5.10) | 4.73(4.06) |
| Other associative talk | 7.41 (7.37) | 9.88(9.02) | 8.61(8.17) |
| Off-topic talk | 20.76(14.99) | 20.25(17.13) | 20.52(15.81) |
| Word Count | 508.76 (204.95) | 543.06 (194.97) | 525.39(197.80) |

*Note.* Significant group differences are shown in bold; * $p < .05$; ** $p < .01$; *** $p < .001$.

We calculated Pearson product moment correlations to assess the interrelations among

the conversational measures for parent and child contribution separately (see Table 2). For both

parents and children's contributions, the number of words was positively correlated with the

number of Facts discussed, $rs \geq .63$, $ps < .0001$, but was uncorrelated with the amount of

emotion talk. There were few significant within-person correlations among the conversational

content codes, suggesting that these codes captured relatively unique aspects of the

conversations. For parents' contributions, Subjective Judgments (e.g., evaluation of character

personality and relationship) were negatively correlated with off-topic talk (i.e., talk that was totally unrelated to the video), $r = -.51$, $p = .0025$, and Parent Emotions were positively related with other associative talk, $r = .40$, $p = .022$. For children's contributions, Facts were positively correlated with Subjective Judgments, $r = .52$, $p = .0017$, and negatively linked with off-topic talk, $r = -.51$, $p = .0025$.

The correlations between parents and children's scores for each conversational content category were also calculated. The results showed that parents and children's talk were highly intercorrelated within each of the content categories ($rs \geq .51$, $ps \leq .0025$). For example, children whose parents had more references to emotions provided more references to emotions as well, $r = .82$, $p < .0001$.

Table 2

*Within-Person Correlations among the Conversational Measures*

| Measures | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Panel 1. Parent Contribution** | | | | | | |
| 1. Facts | -- | | | | | |
| 2. Emotions | -0.18 | -- | | | | |
| 3. Judgments | 0.10 | 0.15 | -- | | | |
| 4. Other associative talk | -0.20 | **0.40**[*] | **-0.34**[a] | -- | | |
| 5. Off-topic talk | -0.26 | -0.21 | **-0.51**[**] | -0.01 | -- | |
| 6. Word count | **0.63**[****] | 0.15 | -0.30 | **0.43**[*] | 0.22 | -- |
| **Panel 2. Child Contribution** | | | | | | |
| 1. Facts | -- | | | | | |
| 2. Emotions | 0.09 | -- | | | | |
| 3. Judgments | **0.52**[**] | 0.32 | -- | | | |
| 4. Other associative talk | -0.23 | 0.28 | -0.22 | -- | | |
| 5. Off-topic talk | **-0.51**[**] | -0.04 | -0.29 | 0.07 | -- | |
| 6. Word count | **0.73**[****] | 0.24 | **0.49**[**] | 0.05 | -0.14 | -- |

*Note.* Significant correlations are shown in bold; [a] $p < .06$, [*] $p < .05$, [**] $p < .01$, [****] $p < .0001$

After the parent-child conversation, parents were asked to rate how much their children remembered about the video on a 1 to 5 scale, with higher scores representing more knowledge about the video. They also indicated how much they themselves knew about the video both

before and after the conversation. Parents believed that their child remembered a great deal about the video, as indicated by an average parent rating of children's knowledge of 3.91 (*SD* = .84). Also, parents rated their own post-conversation knowledge about the video higher than their pre-study knowledge, $t(32) = 3.85$, $p = .0005$, indicating that they believed they had learned much about the video from the conversation.

**Parent-child nonverbal interaction measures.** Table 3 shows the means and standard deviations for the parent-child nonverbal behaviors coded during the videotaped conversation, broken down by group and across the total sample. Recall that all of these scores could range from 0 to 2. The scores in Table 3 reveal that the dyads maintained mutual eye contact quite well during the conversations, and that the parents were quite engaged in the children's talk with few interruptions. In contrast, scores for Parental Warmth (e.g., physical touch) were relatively low. No group or gender differences were found in any of these nonverbal interaction measures.

Table 3

*Parent-Child Nonverbal Interaction Measures by Group and for Total Sample*

| Measures (0 – 2) | FF Group M(SD) | EF Group M(SD) | Overall M(SD) |
|---|---|---|---|
| Mutual eye contact | 1.72(0.36) | 1.68(0.40) | 1.70(0.37) |
| Parent engagement | 1.53(0.39) | 1.42(0.28) | 1.48(0.34) |
| Parent interruption | 0.34 (0.50) | 0.47(0.49) | 0.40(0.49) |
| Parent warmth | 0.65(0.50) | 0.59(0.60) | 0.62(0.54) |

**Children's memory interview performance.** Means and standard deviations for children's memory performance measures are displayed in Table 4. Contrary to our predictions about the effects of conversation manipulation on memory, none of the memory scores differed significantly according to group. The number of prompts used by the experimenter in the memory interviews was also equivalent between groups. Children remembered, on average, 11 out of 19 key events (58%). Further, 93% of the reported propositions about the events were

accurate. To evaluate the developmental changes in memory performance, we conducted a series

of general linear model (GLM) analysis predicting child memory measures from age in months,

controlling for gender and group. As expected, the results revealed that compared to younger

children, older children reported more events, more characters and objects, more event memory

propositions that were accurate, and scored higher on memory accuracy, $F(1, 32) \geq 4.82$, $ps$

$\leq .036$.

Table 4

*Child Memory Performance Measures by Group and for Total Sample*

| Memory Indicators | FF Group M(SD) | EF Group M(SD) | Overall M(SD) |
|---|---|---|---|
| # of key events | 10.18(4.41) | 11.50(3.76) | 10.82(4.10) |
| # of key objects and characters | 9.47(2.65) | 10.38(2.31) | 9.91(2.41) |
| # of accurate propositions | 35.53(24.47) | 41.88(34.78) | 38.61(29.61) |
| Memory accuracy score[1] | 0.90(0.21) | 0.94 (0.09) | 0.93(0.16) |

*Note*. [1]Calculated as the proportion of reported propositions that were accurate.

**Child emotional reaction measures.** Table 5 shows the group and total sample means

and standard deviations for the child emotional reaction scores measured in three ways– child-

rated, parent-rated, and observed in the video-recorded conversations. On average, children were

somewhat happy throughout the experiment. The average scores of children's self-reported

happiness collected before the video, after the video, and after the parent-child conversation,

were all above 4 on a 1 – 5 scale (1 – very unhappy, 5 – very happy); and they did not differ

from each other significantly, indicating that children's self-report of mood did not change over

time. Parental rating at the end of the study on children's upset level during the conversation also

averaged low (1.61 on a 1 – 4 scale; 1 – not at all upset, 4 – very upset). Children's positive and

negative affect displayed during the conversations had an average score of .58 and .59

respectively (coded on 0 – 2 scales, see **Coding** for more detailed scoring scheme).

Reported measures of children's emotional reactions were highly correlated with each other but there was little overlap between the observed and reported scores. Specifically, children's self-rated happiness at three times were highly correlated with each other, $rs \geq .63$, $ps < .0001$. The extent to which children were upset during the conversation rated by parents was also negatively correlated with children's self-reported happiness immediately after the video, $r = -.41$, $p = .018$, and after the conversation, $r = -.66$, $p < .0001$, suggesting that parents were well attuned to how their children felt. Children's nonverbal displays of positive and negative affect during the conversation were negatively correlated with each other, $r = -.42$, $p = .016$, but were not correlated with parent- or child-reported measures. No group differences in any of the child emotional reaction measures were found.

Table 5

*Child Emotional Reaction Measures by Group and for Total Sample*

| Measures | FF Group *M(SD)* | EF Group *M(SD)* | Overall *M(SD)* |
|---|---|---|---|
| **Self-reported happiness (1 – 5)** | | | |
| Time 1 (Pre-video) | 4.18(1.24) | 4.38(0.96) | 4.27(1.10) |
| Time 2 (Post-video/Pre-conversation) | 4.12(1.05) | 4.19(0.19) | 4.15(0.97) |
| Time 3 (Post-conversation) | 4.41(0.71) | 4.25(0.10) | 4.33(0.85) |
| **Parent-reported child upset (1 – 4)** | 1.47(0.72) | 1.75(1.00) | 1.61(0.86) |
| **Observed affects during the conversation (0 – 2)** | | | |
| Positive | 0.68(0.59) | 0.47(0.62) | 0.58(0.60) |
| Negative | 0.52(0.56) | 0.63(0.69) | 0.59(0.62) |

**Predicting Child Memory Performance from Parent-Child Conversational Measures**

**Overview.** As mentioned above, children's memory performance did not vary across the two conversation conditions. To test the degree to which individual differences in parent-child conversation measures predicted children's independent memory performance, both within and across conversation conditions, we tested a series of General Linear Models (GLMs). All models included conversation group because we were interested in whether conversational

measures might interact with group to predict children's memory. Based on the preliminary

analyses of the associations between the memory variables and individual difference factors, we

identified age and gender as important covariates to be included in all models. PPVT score and

the number of prompts used by the experimenter were also expected to be related to children's

memory, but were not finally included in the models as covariates because they were highly

correlated with age ($r = .77$ and $-.68$, $ps < .0001$). The GLM analyses were carried out in three

steps: Model 1 tested the parent conversation measures as predictors of children's memories.

Model 2 tested children's conversational measures as predictors. All models initially included

interactions between each conversational measure and group, but only interactions that were

significant across multiple dependent variables were retained in the final models. The final set of

models (Model 3) simultaneously tested the effects of parents and children's fact and emotion

talk in predicting children's memory. Separate GLMs were carried out for each memory

performance variable.

In order to minimize the number of predictors in each model, we only tested a subset of

conversational categories as predictors – Facts, Emotions, Judgments, and Other Associative

Talk. Word Count and Off-Topic Talk were excluded because the preliminary analyses indicated

that they were highly correlated with other conversational measures and they were of less interest

theoretically than the other measures.

**Model 1: Predicting child memory performance from parent conversation measures.**

Table 6 summarizes the results of Model 1 predicting each of the four memory variables. The $R^2$

values for Model 1 (ranging from .46 to .66) compared to those for the preliminary model (see

**Descriptive Analyses – Children's memory interview performance**; $R^2$ ranged from .16 to .39)

suggested that the child memory performance measures were very well predicted by the parent

conversation measures. Consistent with the preliminary analyses, age was a significant predictor of all the memory indicators, $F$s(1, 32) ≥ 4.89, $ps$ ≤ .037.

Table 6

*Standardized Betas and R-Squares for GLMs Predicting Child Memory Performance from*

*Parent Conversation Measures*

| | # of Key Events | | # of Key Objects & Characters | | # of Accurate Propositions | | Memory Accuracy Score[1] | |
|---|---|---|---|---|---|---|---|---|
| | $R^2$ | B | $R^2$ | B | $R^2$ | B | $R^2$ | B |
| | 0.66 | | 0.48 | | 0.59 | | 0.46 | |
| Group (0=FF, 1=EF) | | **-0.47**[*] | | -0.41 | | -0.38 | | -0.35 |
| Age | | **0.47**[***] | | **0.38**[*] | | **0.57**[***] | | **0.35**[*] |
| Gender (0=F, 1=M) | | -0.06 | | -0.04 | | -0.23 | | 0.02 |
| Facts | | **-0.39**[**] | | **-0.35**[*] | | -0.22 | | 0.12 |
| Emotions | | -- | | -- | | -- | | -- |
|    FF | | **-1.57**[**] | | **-1.07**[a] | | -0.60 | | **-1.49**[*] |
|    EF | | 0.51 | | 0.59 | | **1.06**[*] | | 0.31 |
| Judgments | | 0.13 | | 0.07 | | 0.06 | | -0.25 |
| Associative | | -0.23 | | -0.33 | | **-0.39**[*] | | -0.10 |

*Note.* [1]Calculated as the proportion of memory propositions that were accurate.

Significant estimates are shown in bold; [a] $p$ < .06, [*] $p$ < .05, [**] $p$ < .01, [***] $p$ < .001.

Strikingly, more parental references to video facts during the conversation were associated with children's recall of fewer key events, $F$(1, 32) = 8.52, $p$ = .0075, and fewer key objects and characters, $F$(1, 32) = 4.51, $p$ = .044, across groups. One interpretation for this result is that greater fact talk somehow interfered with children's accurate remembering, but a more likely interpretation is that parents whose children struggled to remember the video used more prompts for what happened. Supporting this interpretation, we found that although parents' fact talk was positively correlated with children's fact talk in terms of the total number of propositions, $r$ = .51, $p$ = .0026, it was also linked to shorter conversational turns of children that

contained factual information, $r = -.37$, $p = .033$. Also, parents' associative talk predicted recall of fewer memory propositions, $F(1, 32) = 5.15$, $p = .033$.

We also found significant interactions between group and parent emotion talk in predicting all the child memory variables, $F(1,32) \geq 6.39$, $ps \leq .019$. Post-hoc analyses of these interactions were conducted. First, estimated dependent variable values were plotted at high (14) and low (3) values of Emotions for both groups (*Figure 2*). These two values were chosen to represent the overlapping range between the two groups (parent emotion scores ranged from 0 – 14 and 3 – 47 for the FF and EF group respectively). Next, simple slope analyses were conducted to determine whether the slopes of the plotted simple regression lines were significantly different from zero. This analysis showed that parent emotion talk during the conversation predicted poorer memory interview performance for children in the FF group, but was either unrelated to or positively related to children's memory scores in the EF group. Specifically, for the FF group, Parent Emotions predicted recall of fewer key events, $F(1, 32) = 12.98$, $p = .0014$, fewer key characters and objects, $F(1, 32) = 3.99$, $p = .057$, and lower memory accuracy score, $F(1, 32) = 7.25$, $p = .013$. In contrast, for the EF group, parent emotion talk was positively associated with the number of accurately recalled memory propositions, $F(1, 32) = 4.67$, $p = .041$, and was unrelated to the other memory variables.
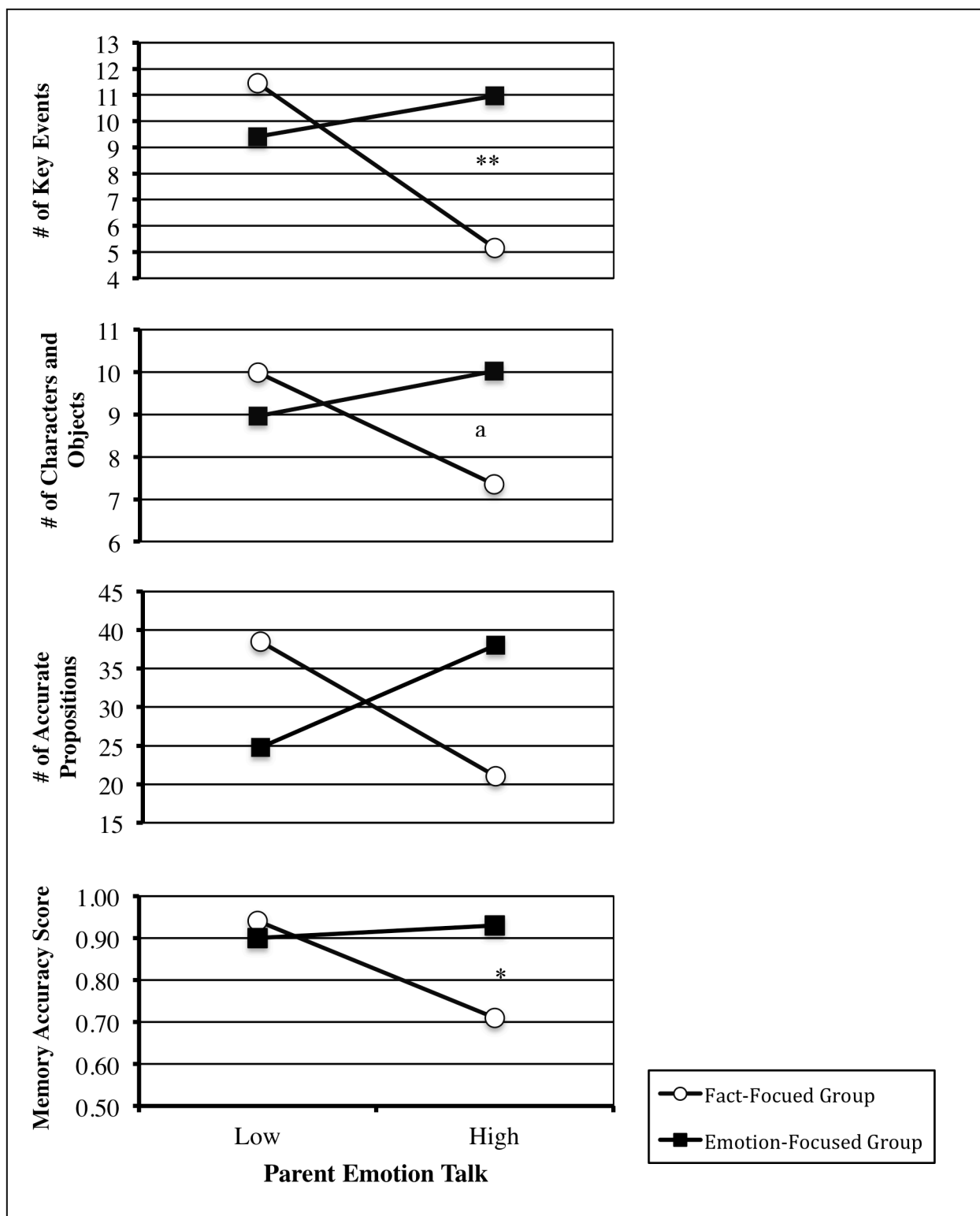
*Figure 2.* The interactions between group and parent emotion talk in predicting child memory performance. *a, *, *** indicate a group difference in child memory performance that was significant at the level of $p < .06$, $p < .05$, and $p < .01$, respectively.

Tests of group differences at different values of emotion talk showed that when parents had no emotion talk, there was a significant group difference: children in the FF group recalled more key events than those in the EF group, $F(1, 32) = 4.73$, $p = .40$. However, the interaction analyses further revealed that this group difference disappeared and was reversed at higher levels of emotion talk. When the number of parental references to emotions was as high as 14, children in the EF group recalled more key events, $F(1, 32) = 11.10$, $p = .0028$, more key characters and objects, $F(1, 32) = 4.14$, $p = .053$, and scored higher on memory accuracy, $F(1, 32) = 6.26$, $p = .020$, than those in the FF group (see *Figure 2*). These results further revealed that parental emotion talk, particularly at high levels, had different implications for child memory interview performance for the two groups.

**Model 2: Predicting child memory performance from child conversation measures.** When considered alone as predictors, children's conversational measures did not significantly predict their memory performance, across multiple memory indicators. There were no interactions between group and conversational measures, thus the final model only contained main-effect terms, none of which were significant.

**Model 3: Predicting child memory performance from parent and child fact and emotion talk.** According to the first two models, parent conversation measures were better predictors of child memory performance than children's own contribution measures. It seems possible that children's contributions to the conversations might be related to their memory when also taking into account their parents' contributions. We addressed this question in Model 3 by including both parent and child conversation measures in the same model. Because Facts and Emotions were the two conversational variables that predicted multiple child memory measures

in Model 1, and because these were the two dimensions of talk most central to the goals of this paper, we focused on these two content categories for both parent and child contributions in order to reduce the total number of predictors. Model 3 also tested interactions between group and parent emotion talk because it was significant in predicting several dependent variables in Model 1. The results for this model are summarized in Table 7.

Table 7

*Standardized Betas and R-Squares for GLMs Predicting Child Memory Performance from Parent and Child Emotion and Fact Talk*

| | # of Key Events | | # of Key Objects and Characters | | # of Accurate Propositions | | Memory Accuracy Score[1] | |
|---|---|---|---|---|---|---|---|---|
| | $R^2$ | B | $R^2$ | B | $R^2$ | B | $R^2$ | B |
| | 0.76 | | 0.48 | | 0.64 | | 0.47 | |
| Group (0=FF, 1=EF) | | **-0.42**[*] | | -0.47 | | -0.26 | | -0.42 |
| Age | | 0.20 | | 0.25 | | 0.28 | | 0.35 |
| Gender (0=F, 1=M) | | 0.05 | | 0.05 | | -0.12 | | -0.01 |
| **Parent Talk** | | | | | | | | |
| Facts | | **-0.70**[****] | | **-0.48**[*] | | **-0.52**[**] | | 0.08 |
| Emotions | | -- | | -- | | -0.33 | | -- |
| FF Group | | **-1.32**[**] | | **-1.43**[*] | | -- | | **-2.16**[**] |
| EF Group | | **0.55**[a] | | 0.21 | | -- | | -0.09 |
| **Child Talk** | | | | | | | | |
| Facts | | **0.59**[***] | | 0.30 | | **0.61**[**] | | 0.02 |
| Emotions | | -0.25 | | 0.33 | | -0.24 | | 0.46 |

*Note.* [1]Calculated as the proportion of memory propositions that were accurate.

Significant estimates are shown in bold; [*]$p < .05$, [**]$p < .01$, [***]$p < .001$, [****]$p < .0001$.

Overall, this model predicted child memory performance measures very well, with $R^2$s ranging from .47 to .76. In alignment with the patterns revealed in first two models, parents' and children's contribution had different associations with children's memory performance. Whereas parent emotion talk once again interacted with group in predicting children's memories of the video, children's emotion talk did not predict any memory performance scores. Moreover,

parental talk about the facts of the video was linked to poorer memory in children, but children's fact talk was associated with better memory interview performance across groups.

Replicating the results of Model 1, parents' fact talk was associated with poorer child memory. More parental references to the facts about the video were linked to children's recall of fewer key events, $F(1, 32) = 24.60$, $p < .0001$, fewer key objects and characters, $F(1, 32) = 5.31$, $p = 0.030$, and fewer accurate propositions, $F(1, 32) = 9.00$, $p = .0062$. Children's fact talk during the conversations was positively related to their later memory performance in the interviews, even though it was unrelated to children's memory in Model 2. Thus, when Parent contributions were controlled for, Child Facts predicted more key events recalled, $F(1, 32) = 17.58$, $p = .0003$, and more propositions accurately reported, $F(1, 32) = 12.28$, $p = .0018$.

As in Model 1, the third model also revealed significant interactions between group and parent emotion talk in predicting several memory indicators – the numbers of key events, key characters and objects, and the memory accuracy score, $F(1, 32) \geq 6.12$, $ps \leq .021$. For all the significant interactions, simple slope analyses were conducted to further determine whether the relations between parental emotion talk and child memory performance measures were significantly different from zero for each group. The breakdowns of the simple slopes for the two groups are shown in Table 7. For the FF group, parent emotion talk was linked to children's recollection of fewer key events, $F(1, 32) = 9.08$, $p = .0060$, fewer key characters and objects, $F(1, 32) = 4.92$, $p = .036$, and lower memory accuracy score, $F(1, 32) = 11.18$, $p = .0027$. For the EF group, parent emotion talk was only positively associated with the number of recalled key events, $F(1, 32) = 4.22$, $p = .051$.

**Predicting Parent Conversation Measures**

The final set of analyses was conducted to explore parent- and child-related factors that may contribute to individual differences in the way parents constructed the conversations. We focused on examining the predictive values of children's emotional reactions, parent-child nonverbal interaction qualities, and parent's attachment styles as predictors in three separate GLMs, so as to keep a minimum number of predictors in each model. All models included age, gender and group as covariates. Parent conversation measures (i.e., Facts, Emotions, Judgments, Other Associative Talk, and Off-topic Talk) were dependent variables tested in separate models.

First, we examined the extent to which children's emotional reactions predicted parents' conversational measures. We tested three types of children's emotional reaction measures as predictors in three separate models. Because child self-reported measures of happiness at three times were highly correlated with each other (see **Descriptive Analyses**), in order to reduce the collinearity among predictors, we only included the self-reported score at time 2 in the first model because we were particularly interested to test how children's emotional reactions immediately after the video may influence the following conversations guided by the parents. In another two separate models, we examined the predictive values of parent-rated child upset level during the conversation, and children's positive and negative affect displayed in the conversations.

The results of this set of models (Table 8) suggest that child emotional reaction measures were related to several parent conversation measures. The trend was that parents whose children were feeling more negatively across several measures had less talk directly about the video but had more talk about other subjects. Specifically, children who rated themselves as less happy immediately after the video had parents who made fewer references to video facts, $F(1, 32) =$

5.35, $p = .028$, but had increased off-topic talk, $F(1, 32) = 5.84$, $p = .022$. Similarly, parents who

reported their children more upset during the conversations had less fact talk, $F(1, 32) = 3.89$, $p$

$= .059$. We found the same patterns in the relationship between the observed measure of

children's negative affect and parent conversational measures: more intense negative affect that

children displayed during the conversations predicted fewer parental references to subjective

judgments on the video, $F(1,31) = 9.32$, $p = .0052$, but more parent associative talk, $F(1, 31) =$

$4.25$, $p = .049$, and more parent off-topic talk, $F(1, 31) = 16.85$, $p = .0004$.

Table 8

*Standardized Betas and R-Squares for GLMs Predicting Parent Conversation Measures from*

*Child Emotional Reaction Measures*

| | Facts | | Emotions | | Judgments | | Other Associative Talk | | Off-Topic Talk | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $R^2$ | $B$ | $R^2$ | $B$ | $R^2$ | $B$ | $R^2$ | $B$ | $R^2$ | $B$ |
| **Model 1:** Self-Reported Measure | 0.23 | | 0.32 | | 0.16 | | 0.06 | | 0.22 | |
| Group (0=FF, 1=EF) | | -0.16 | | **0.56**\*\* | | -0.16 | | 0.18 | | 0.03 |
| Age | | -0.16 | | -0.004 | | 0.02 | | 0.11 | | -0.25 |
| Gender (0=F, 1=M) | | 0.12 | | 0.05 | | 0.26 | | 0.03 | | 0.07 |
| Self-Rated Happiness[1] | | **0.39**\* | | 0.08 | | 0.27 | | -0.11 | | **-0.40**\* |
| **Model 2:** Parent-Reported Measure | 0.18 | | 0.33 | | 0.11 | | 0.06 | | 0.10 | |
| Group (0=FF, 1=EF) | | -0.09 | | **0.58**\*\*\* | | -0.12 | | 0.19 | | -0.02 |
| Age | | -0.20 | | -0.01 | | 0.01 | | 0.11 | | -0.23 |
| Gender (0=F, 1=M) | | 0.15 | | 0.06 | | 0.27 | | 0.03 | | 0.05 |
| Parent-Rated Upset | | **-0.34**ᵃ | | -0.14 | | -0.16 | | -0.11 | | 0.20 |
| **Model 3:** Observed Measures | 0.14 | | 0.33 | | 0.38 | | 0.18 | | 0.44 | |
| Group (0=FF, 1=EF) | | -0.09 | | **0.57**\*\* | | -0.10 | | 0.12 | | 0.001 |
| Age | | -0.20 | | 0.01 | | -0.005 | | 0.17 | | -0.21 |
| Gender (0=F, 1=M) | | 0.15 | | 0.09 | | **0.37**\* | | 0.02 | | -0.06 |
| Postive Affect[2] | | 0.02 | | 0.18 | | 0.08 | | 0.14 | | 0.14 |
| Negative Affect[2] | | -0.28 | | -0.003 | | **-0.53**\*\* | | **0.41**\* | | **0.68**\*\*\* |

*Note.* [1]collected immediately after the video.

[2]coded based on the parent-child conversation videos.

Significant estimates are shown in bold; ᵃ $p < .06$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Next, we tested whether parent-child non-verbal interaction qualities related to the way parents guided the conversations. As shown in Table 9, parents who interrupted their children more frequently during the conversations also had more references to facts of the video, $F(1, 31) = 8.28$, $p = .0085$. We further showed that parents who interrupted their children more frequently took more conversational turns inquiring about video facts, $r = .38$, $p = .031$. Parents who showed more warmth behaviors (e.g., physical touches) had more associated talk, $F(1, 31) = 3.94$, $p = .059$. Additional exploration revealed that parent warmth behavior was positively correlated with child negative affect displayed during the conversation, $r = .36$, $p = .044$; moreover, although only marginally significant, parent warmth predicted less fact talk, $F(1, 31) = 3.44$, $p = .076$, and more off-topic talk, $F(1, 31) = 3.12$, $p = .090$. Thus parents who showed more warmth behaviors might have children who appeared more distressed, thus as strategies of reducing children's negative feelings, parents switched the talk about what happened in the video to related or unrelated other topics.

Table 9

*Standardized Betas and R-Squares for GLMs Predicting Parent Conversation Measures from Parent-Child Nonverbal Interaction Measures*

| | Facts | | Emotions | | Judgments | | Other Associative Talk | | Off-Topic Talk | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $R^2$ | $B$ | $R^2$ | $B$ | $R^2$ | $B$ | $R^2$ | $B$ | $R^2$ | $B$ |
| | 0.40 | | 0.32 | | 0.21 | | 0.33 | | 0.19 | |
| Group (0=FF, 1=EF) | | -0.15 | | **0.57**** | | -0.08 | | 0.14 | | -0.01 |
| Age | | -0.31 | | 0.01 | | 0.03 | | 0.22 | | -0.33 |
| Gender (0=F, 1=M) | | 0.09 | | 0.08 | | 0.18 | | 0.13 | | 0.19 |
| Mutual Eye contact | | -0.17 | | 0.09 | | -0.07 | | 0.21 | | 0.20 |
| Parent Engagement | | 0.29 | | 0.03 | | 0.39 | | -0.34 | | -0.24 |
| Parent Interruption | | **0.44*** | | -0.08 | | -0.07 | | -0.30 | | 0.15 |
| Parent Warmth | | -0.37 | | 0.12 | | -0.19 | | **0.43ª** | | 0.41 |

*Note.* Significant estimates are shown in bold; ª $p < .06$, * $p < .05$, ** $p < .01$.

In the final set of models, we investigated whether the way parents guided memory talk was predicted by parent-child attachment. None of the four parent attachment style scores – Secure, Fearful, Dismissing, and Preoccupied – significantly predicted any conversational measures. Unexpectedly, across all models, parents' talk did not vary with child age. Gender was not related to most of the parent conversational measures except for Judgments; parents made more references to subjective judgments on the video with boys than with girls.

**Discussion**

The first objective of this study was to investigate the impact of conversational goals on the way parents guide discourse with children about past negative events. The analyses of parent conversational measures demonstrate that parents who were instructed to talk with their children with an emotion regulation goal (i.e., parents in the Emotion-Focused group), talked more about emotions related to the stressful video, compared to those who were instructed to simply find out what happened (i.e., parents in the Fact-Focused group). More importantly, children in the Emotion-Focused condition also had more references to emotions than those in the Fact-focused group, illustrating the impact of parents' guidance on children's talk.

Parents in the two conditions, however, did not differ in the amount of other types of conversational content such as references to facts of the video, suggesting that having a goal of regulating children's emotions does not necessarily diminish parents' talk about the event per se. In fact, parents' discussion of what happened in the video comprised over half of their talk during the conversation, whereas emotion talk only comprised a small portion of their contribution. The fact that the emotion regulation goal did not reduce parents' fact talk was consistent with the proposal that young children often learn how to understand and regulate emotions in the context of reminiscing about past distressing events with adults (e.g., Fivush,

1998; Fivush & Haden, 1997; Fivush et al., 2003). Instead of merely inquiring about children's feelings, parents with the emotion regulation goal had to first figure out what happened in the video from their children, and then elaborate on it to make sure that the children understood it in an emotionally adaptive way. This is the first experimental demonstration of the impact of an emotion regulation goal on parent-child conversations about past stressful events.

Replicating previous research findings (e.g., Fivush, 1991; Peterson & McCabe, 2004), all of the parent and child conversational content measures were highly correlated with each other. This result was not surprising given that children's contributions to the conversations were most of the time in responses to parents' prompts. Because parents were absent when children were watching the video, and had little knowledge about it before conversing with children, the majority of parent-child talk involved parents asking questions about the video or about children's feelings and children responding to those questions. In other words, the correlations between parent and child contributions may reflect the guiding roles of parents in the discourse.

One unique finding in the current investigation was that parents' and children's emotion talk were slightly different: children made more references to positive or neutral than negative emotions, whereas parents referred to relatively equal amounts of negative and non-negative emotions. This result may reflect that children did not feel stressed about the video at all. Because the video we used was only mildly stressful, and ended with a happy scene depicting the main character getting adopted by a loving family, it is possible that most of the children in our sample did not perceive it as distressing while watching it. Alternatively, children may have felt that the video was stressful at some points, but when reminiscing about it with parents, instead of accurately reporting their past feelings about the video, they may have only reported their momentary emotions. The latter explanation fits with the emotional development literature

suggesting that young children's memory and understanding of past emotional experiences can be influenced by current environmental cues (e.g., Lagattuta, Wellman, & Flavell, 1997).

Another goal of this study was to examine how different ways in which parents guide conversions about past negative events affect children's independent recall of those events. We didn't find any group differences in children's memory performance; nonetheless, there were several associations between individual differences in parent conversational measures and children's memory indicators. One of the most striking findings is that parents' conversational measures were much better predictors of child memory than children's own contribution measures, even though these two sets of measures were highly correlated. The lack of direct links between children's contributions to the conversations and their own memory performance in the subsequent interviews may have to do with the nature of the discourse contexts: in the structured memory interviews with the experimenter, children's responses were more reflective of the qualities of their memories for the video; whereas in the prior conversations with parents, children's responses were largely oriented by parents' prompts, thus may be less representative of what they really remembered.

How do we interpret the multiple links between parents' contributions and children's memories? The existing parent-child reminiscing literature provides abundant evidence for the proposal that parental talk about past events can have a strong and lasting impact on children's memories for those events (Fivush et al., 2011; Reese & Fivush, 2008; Wareham & Salmon, 2006). Therefore, it is possible that the way parents talked or inquired about the video shaped children's responses during the conversations, which further affected children's understanding and ultimately, memories of the video. However, a closer examination on these associations suggests that this interpretation is not completely accurate.

First, we found that parental references to facts about the video during the conversations related to poorer child memory performance on several indicators (e.g., the number of key events recalled) across groups. If the associations between parental talk and child memory were completely driven by influences from parents, then one would expect parents' fact talk, which was positively correlated with children's fact talk during the conversations, to also positively relate to children's recall of the video in the memory interviews. This prediction is consistent with much existent work showing that children recall discussed information about an event better than that has not been talked about (e.g., Leitchman et al., 2000; Haden et al., 2001). However, our result was the very opposite to this prediction. One explanation is that the negative association between parents' fact talk and children's later recall may reflect parents' responses to children's performance; parents whose children struggled to remember the video provided more prompts for what happened. Supporting this interpretation, we found that parents' fact talk was linked with shorter conversational turns of children that contained video information; in other words, parents were aware of how well their children remembered the video during the conversions, and structured their talk in according ways. This finding that is different from that of other work may have to do with the nature of the discussed event. In most of the prior research, parents knew well about the events that they were asked to talk about (e.g., Bauer et al., 2007; Cleveland, 2007; Haden, et al., 2001; Leichtman et al., 2000), thus were able to provide much factual information which improved children's later recall; in comparison, parents in the current study did not know much about the video, and had to ask many questions rather than providing information about the video.

Another surprising finding is that parents' emotion talk interacted with group in predicting several child memory indicators. For the Fact-Focused group, children whose parents

had more references to emotions performed worse in the memory interviews across several indicators; in contrast, for the Emotion-Focused group, parental emotion was unrelated or positively related to children's memory performance. These effects do not appear to be explained by a simple fact-emotion trade-off because, 1) it cannot account for why the relations were different between groups, and 2) parental references to facts were actually negatively related to child memory across groups. A more legitimate explanation is that the negative association between parent emotion talk and child memory for the Fact-Focused group may reflect parents' reaction to children's performance; parents whose children had more difficulty recalling the video during the conversations may have more concerns about how children felt. In contrast, parental mention of emotions in the Emotion-Focused group may be simply driven by the emotion-oriented conversation instruction. This interpretation, once again, emphasizes the impact of children's contributions on certain aspects of the way parents guide memory conversations.

To summarize, our results revealed a complex bidirectional relationship between how parents guide conversations with their children about past stressful events and how well children remember and retell those events. First, in concordance with prior research, our study illustrates the important roles of parents in guiding discourse about past events; meanwhile, children's responses during these conversations also influence the way parents talk to them. These patterns illustrating the transactional nature of parent-child memory sharing fits very well with modern developmental theories, which adopt an organismic perspective that emphasizes the active roles of children in affecting their own environments.

Another objective of this study was to explore factors that predict individual differences in the way that parents structure conversations with children about negative events. The content

analyses of the parent-child conversations showed that parents differed in the way of guiding conversations about the video: regardless of whether they were given the emotion-focused or the fact-focused instruction, some parents inquired a lot about children's feelings whereas others focused much on the details of what happened; some parents did quite well at keeping the conversations relevant to the video, whereas others had a great amount of off-topic talk.

We examined several factors, both parent-related and child-related, that may contribute to these individual differences. Parents' talk did not change according to child age and gender (except for judgment talk, which was more common in conversations with boys). However, we found multiple links between children's emotional reaction indicators and parent contribution measures. One explanation for these associations is that the way in which parents talked about the stressful video may have certain on-the-spot effects on how children felt. If this interpretation is accurate, then one would expect more fact talk to elicit more stress in children and therefore to relate to more negative emotions. However, the results conflict with this interpretation: more parent talk about the video (e.g., judgments, facts) related to fewer negative feelings or higher positive mood in children. An alternative explanation is that the structure of parents' contribution may be influenced by how children emotionally reacted in the discourse. More specifically, parents perceived children's feelings while talking with them and structured the conversations in ways that facilitate coping. Indeed, parents with children who appeared more distressed had more off-topic or associative talk, or made fewer direct references to the video, suggesting that these parents were trying to regulate children's stress by distracting them from reminiscing about the video.

Another set of predictors of parents' conversational measures that we tested is parent-child nonverbal interaction qualities. Parents who interrupted their children more frequently

asked more about what happened in the video. Also parent who showed more warmth behaviors (spontaneous positive affect or physical touch) had more associative talk. We further showed that this relationship might have to do with parents' attempts to distract distressed children from thinking about details of the video.

Finally we tested how parent attachment styles related to the way they guided the conversations. It was shown in several previous studies that secure children and mothers had more elaborative and emotionally open memory conversations than insecurely attached dyads did (e.g., Laible, 2011; Mcquaid et al. 2007). However, in the current investigation, we failed to find any associations between attachment and child memory performance. This null result may have to do with the nature of the video event. Previous work that found links between attachment and parental reminiscing style was based on conversations about highly emotional real-life events that both parents and children experienced, whereas parents in the current study had to discuss an unfamiliar video with children, which may not have evoked the attachment system. It is possible that parents with securely attached children would have had more discussion of emotions if they knew more about the video. Moreover, the attachment measure used in this analysis was only parents' self-report of their relationship with others, which may not well represent their relationship with the children.

We acknowledge that there are a number of limitations to this study. First, due to lack of group differences in children's memory scores, we were not able to establish causal relationship between parent- guided conversations and children's memories. This null result may have to do with the large variation in the parent conversational measures within each group. To pinpoint the effect of a certain aspect of parent talk, future work should have more confined instructions asking parents to only focus on talking about that particular aspect (e.g., fact or emotion). Also,

the timeline was short – children's memory interview was only about 15 to 20 minutes separated from the parent-child conversation. We might have observed a more dramatic group effect if the interviews took place after a longer delay during which children's memories might begin to fade (therefore providing a greater potential role for conversational effects). Finally, the video used in the study did not seem to evoke much stress in children based on reported and observed measures of children's emotional reaction. Future analyses should incorporate physiological measures of child stress that we collected at several points during the experiments to further confirm the other measures.

## Conclusion

Prior work examining the effects of parent-child reminiscing about past experiences on children's recall of those experiences has focused almost exclusively on non-stressful events. The current study expanded this body of work by investigating the relations between parent-guided memory talk about a stressful event and children's recollection of that event, and by testing specifically the effect of an emotion regulation goal on these conversations and memories. Using an experimental paradigm, our study directly supported the proposal that parental goals affect how they guide conversations with children about past stressful events; parents who aim to help children regulate their feelings have more discussion of emotions without reducing talk about other aspects of the events. The patterns observed also highlight the bidirectional nature of parent-child memory sharing: parents play a guiding role in conversing with children about the past; meanwhile, children's verbal and non-verbal responses during the talk also have influences on the way parents structure the discourse. The existent parent-child reminiscing literature has been emphasizing parents' roles in shaping children's memories, but how children affect parents during these conversations has been less commonly examined. Although there have been some

efforts on exploring child-related factors (e.g., age, gender, temperament) in predicting parental reminiscing style, the current study adds to our understanding of how parents and children reciprocally influence each other during the memory sharing process.

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Appendix A: Video Components

Child Memory Interview and Coding Checklist

| Key Events | Featured Actions (M – Medusa, P – Penny) |
|---|---|
| □1.Medusa talked with Penny. | □M called P.<br>□M & P talked about getting diamond. |
| □2. Medusa took Penny to the cave. | □M took P to cave/P went to cave.<br>□M asked P to get down/ P had to get down. |
| □3. Medusa took Penny's bear. | □M took P's Teddy.<br>□M wouldn't return Teddy unless P got down. |
| □4. Penny went down the cave. | □P went into bucket.<br>□P was rolled/sent down. |
| □5. Penny got down in the cave. | □Skeleton of pirate.<br>□Water came up from a hole. |
| □6. Mice crossed the hole. | □One mouse almost fell.<br>□Mice got across or the mouse was saved. |
| □7. Mice found the diamond. | □Mice found diamond.<br>□They saw it in a skull. |
| □8. Mice tired getting the diamond. | □Mice tried pushing diamond out.<br>□Mice couldn't get diamond/diamond was stuck. |
| □9. Penny crossed the hole. | □P almost fell.<br>□P got across. |
| □10. Penny got the diamond | □P used sword.<br>□P got the diamond out of skull. |
| □11.  Penny left the cave. | □P got into whirlpool/water.<br>□P was pulled up/left the cave. |
| □12. Medusa got the diamond. | □M got diamond/P gave diamond to M.<br>□S wanted diamond but M wouldn't give him. |
| □13. Gun threatening. | □M had a gun.<br>□M told them not to follow her. |
| □14. Penny wanted the bear back. | □P wanted Teddy back.<br>□M would not return Teddy. |

| | |
|---|---|
| □15. Medusa got tripped. | □Mice threw a rope.<br>□M tripped/fell. |
| □16. Penny got the bear and diamond. | □M dropped Teddy.<br>□P grabbed/got Teddy. |
| □17. Penny got in a boat. | □P got in a boat.<br>□M grabbed on rope attached to boat /chased P. |
| □18. Medusa chased the boat. | □M got on crocodiles.<br>□Rope broke/M was left behind. |
| □19. Mice watched the news. | □Diamond was turned in.<br>□P got adopted/got new parents. |

**Key Characters:**
□Penny □Medusa □Mice □Bianca □Bernard □Snoop □Alligators

**Key Objects:**
□Diamond □Teddy bear □Cave □Water in the cave □Hole in the cave □Skull □Sword □Bucket □Boat

Appendix B: Parent-Child Conversation Instructions

The instruction for parents in FF (Fact-Focused) group is as follows: *"Your child has finished watching the video. Now we would like you to talk to your child about it. See what your child thinks happened in the movie. If necessary, see if you can help him/her understand what happened. You and your child will have 10 minutes to talk about the video.*"

For parents in EF (Emotion-Focused) condition, the talking instruction is: *"Your child has finished watching the video. Now we would like you to talk to your child about it. See what your child thinks happened in the movie and how s/he felt about it. If necessary, see if you can help him/her understand what happened to make sure that he/she feels all right about it. You and your child will have 10 minutes to talk about the video.*"

Appendix C: Child Self-Reported Mood Scales

**<u>Before Video</u>**

*Point to one of these faces to show me how you are feeling right now. Are you very unhappy, a*

*little bit unhappy, so-so, a little bit happy or very happy* [Pointing to each face in turn]?
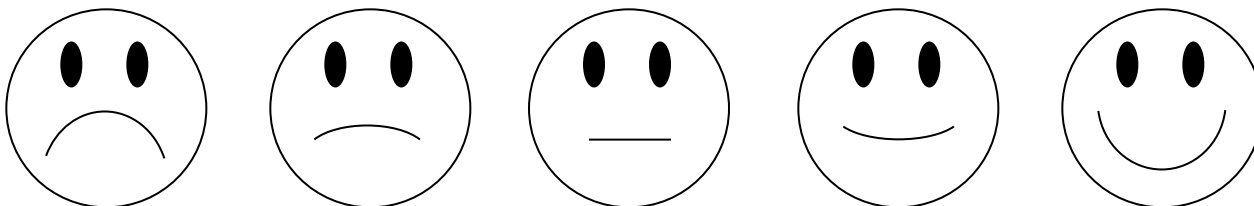
**<u>After Video</u>**

*Point to one of these faces to show me how you are feeling right now. Are you very unhappy, a*

*little bit unhappy, so-so, a little bit happy or very happy* [Pointing to each face in turn]?
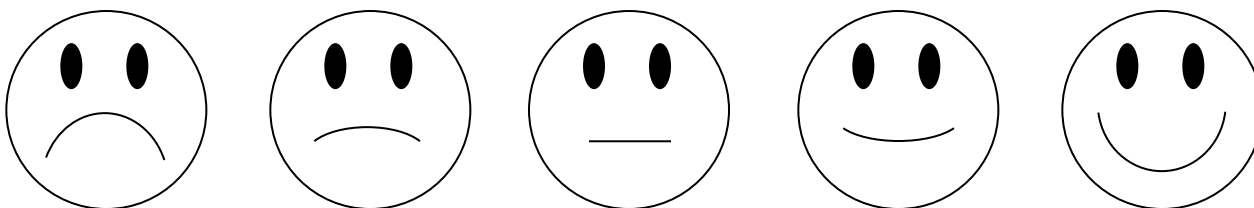
**<u>After Conversation</u>**

*Point to one of these faces to show me how you are feeling right now. Are you very unhappy, a*

*little bit unhappy, so-so, a little happy or very happy* [Pointing to each face in turn]?
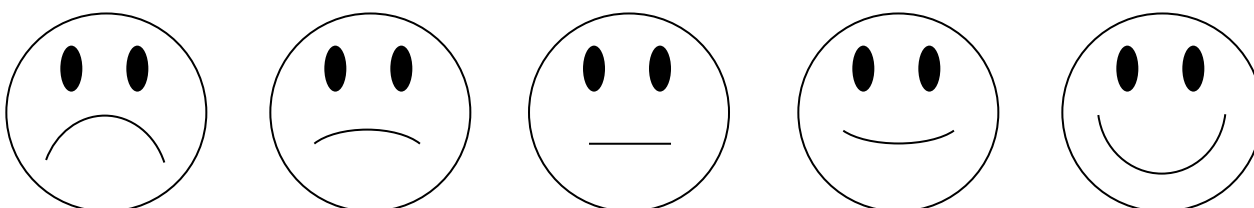
Appendix D: Relationship Questionnaires

Relationship Questionnaire (RQ) – Parents

PLEASE READ THE DIRECTIONS!

1. Following are descriptions of four general relationship styles that people often report. Please read each description and CIRCLE the letter corresponding to the style that best describes you or is closest to the way you generally are in your close relationships.
   A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.
   B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.
   C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.
   D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

2. Please rate each of the relationship styles described above, according to the extent to which you think each description corresponds to your general relationship style.

|  | Not at all like me |  |  | Somewhat like me |  |  | Very much like me |
|---|---|---|---|---|---|---|---|
| Style A. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Style B. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Style C. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Style D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Relationship Scale Questionnaire (RSQ) – Parents

Please read each of the following statements and rate the extent to which you believe each statement best describes your feelings about <u>close relationships</u>.

| | Not at all like me | | Somewhat like me | | Very much like me |
|---|---|---|---|---|---|
| 1. I find it difficult to depend on other people. | 1 | 2 | 3 | 4 | 5 |
| 2. It is very important to me to feel independent. | 1 | 2 | 3 | 4 | 5 |
| 3. I find it easy to get emotionally close to others. | 1 | 2 | 3 | 4 | 5 |
| 4. I want to merge completely with another person. | 1 | 2 | 3 | 4 | 5 |
| 5. I worry that I will be hurt if I allow myself to become too close to others. | 1 | 2 | 3 | 4 | 5 |
| 6. I am comfortable without close emotional relationships. | 1 | 2 | 3 | 4 | 5 |
| 7. I am not sure that I can always depend on others to be there when I need them. | 1 | 2 | 3 | 4 | 5 |
| 8. I want to be completely emotionally intimate with others. | 1 | 2 | 3 | 4 | 5 |
| 9. I worry about being alone. | 1 | 2 | 3 | 4 | 5 |
| 10. I am comfortable depending on other people. | 1 | 2 | 3 | 4 | 5 |
| 11. I often worry that romantic partners don't really love me. | 1 | 2 | 3 | 4 | 5 |
| 12. I find it difficult to trust others completely. | 1 | 2 | 3 | 4 | 5 |
| 13. I worry about others getting too close to me. | 1 | 2 | 3 | 4 | 5 |
| 14. I want emotionally close relationships. | 1 | 2 | 3 | 4 | 5 |
| 15. I am comfortable having other people depend on me. | 1 | 2 | 3 | 4 | 5 |
| 16. I worry that others don't value me as much as I value them. | 1 | 2 | 3 | 4 | 5 |
| 17. People are never there when you need them. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 18. My desire to merge completely sometimes scares people away. | 1 | 2 | 3 | 4 | 5 |
| 19. It is very important to me to feel self-sufficient. | 1 | 2 | 3 | 4 | 5 |
| 20. I am nervous when anyone gets too close to me. | 1 | 2 | 3 | 4 | 5 |
| 21. I often worry that romantic partners won't want to stay with me. | 1 | 2 | 3 | 4 | 5 |
| 22. I prefer not to have other people depend on me. | 1 | 2 | 3 | 4 | 5 |
| 23. I worry about being abandoned. | 1 | 2 | 3 | 4 | 5 |
| 24. I am somewhat uncomfortable being close to others. | 1 | 2 | 3 | 4 | 5 |
| 25. I find that others are reluctant to get as close as I would like. | 1 | 2 | 3 | 4 | 5 |
| 26. I prefer not to depend on others. | 1 | 2 | 3 | 4 | 5 |
| 27. I know that others will be there when I need them. | 1 | 2 | 3 | 4 | 5 |
| 28. I worry about having others not accept me. | 1 | 2 | 3 | 4 | 5 |
| 29. Romantic partners often want me to be closer than I feel comfortable being. | 1 | 2 | 3 | 4 | 5 |
| 30. I find it relatively easy to get close to others. | 1 | 2 | 3 | 4 | 5 |

Child Relationship Questionnaire

Practice items
1. *I wish to be a teacher. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point your finger on one of these dots to show me how much you wish to be a teacher.*

○  ●  ●  ⬤
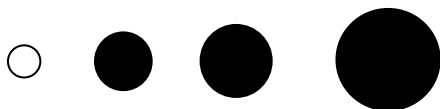
(If child successfully point to a dot, say: "*Great! That's just how you play! Let's try another one."* If not, point child's finger at dots in order and explain, then say: "*Now point to one of these dots to show me how much you wish to be a teacher."* If child successfully point to a dot, continue; if not, skip this questionnaire. )

2. *When I'm at school, I feel happy. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how happy you feel when you're at school.*

○  ●  ●  ⬤
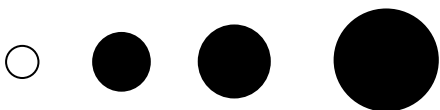
(If child successfully point to a dot, say: "Great! Now you know how to play it! Let try more." If not, skip this questionnaire.)

Actual items **(MARK CHILD'S RESPONSES)**
1. *I wish [Mom/Dad] could pay more attention to me. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you wish your [Mom/Dad] could pay more attention to you.*

○  ●  ●  ⬤
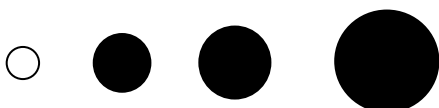
2. *I wish [Mom/Dad] could spend more time with me. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you wish your [Mom/Dad] could spend more time with you.*
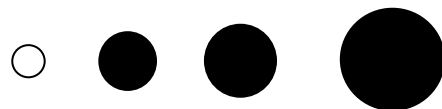
○  ●  ●  ⬤
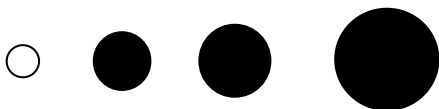
3. *I wish [Mom/Dad] could know more about me. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you wish your [Mom/Dad] could know more about you.*
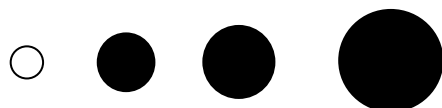
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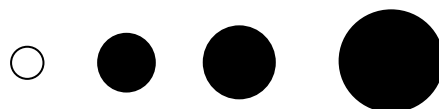
4. *I wish [Mom/Dad] could know more about how I feel. How much do **you** feel this way? Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you wish your [Mom/Dad] could know more about how you feel.*
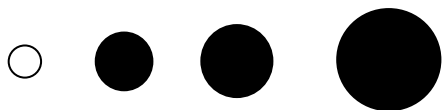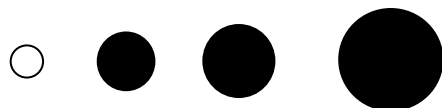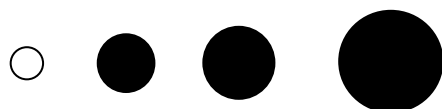
5. *I like spending time with [Mom/Dad]. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you like spending time with your [Mom/Dad].*

6. *I wish I could be closer to [Mom/Dad], which means I wish my mom could talk and play with me more often. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you wish you could be closer to your [Mom/Dad]?*
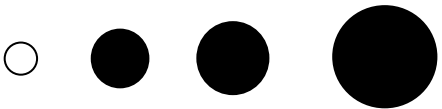
7. *I wish I could talk about more things with [Mom/Dad]. How much do **you** feel this way? Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you wish you could talk about more things with your [Mom/Dad].*

8. *When I'm with [Mom/Dad], I feel COMFORTABLE/EASY. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how COMFORTABLE/EASY you feel when you are with your [Mom/Dad].*
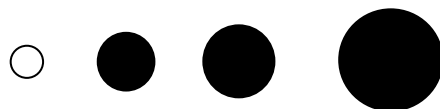
9. *When I'm with [Mom/Dad], I feel [she/he] IGNOREs me, which means I feel [she/he] doesn't pay attention to me. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much you feel your [Mom/Dad] IGNOREs you when you are with [her/him].*
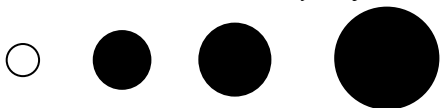
10. *When I'm with [Mom/Dad], I feel HAPPY. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how HAPPY you feel when you are with your [Mom/Dad].*
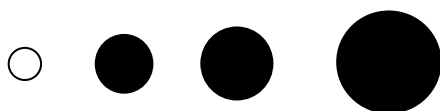
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11. *When I'm with [Mom/Dad], I feel ANGRY. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how ANGRY you feel when you are with your [Mom/Dad].*
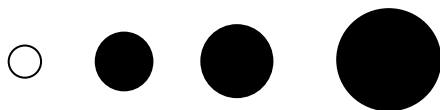
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12. *When I'm with [Mom/Dad], I feel BORED. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how much BORED you feel when you are with your [Mom/Dad].*
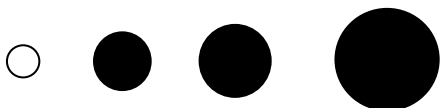
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13. *When I'm with [Mom/Dad], I feel IMPORTANT, which means I feel [Mom/Dad] cares about me. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how IMPORTANT you feel when you are with your [Mom/Dad].*

○ ● ● ●

14. *When I'm with [Mom/Dad], I feel UNHAPPY. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how UNHAPPY you feel when you are with your [Mom/Dad].*

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15. *When I'm with [Mom/Dad], I often feel SCARED. How much do **you** feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how SCARED you feel when you are with your [Mom/Dad].*
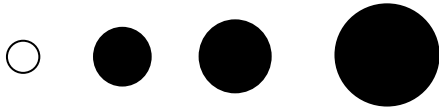
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16. *When I'm with [Mom/Dad], I feel SAFE. How much do* **you** *feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how SAFE you feel when you are with your [Mom/Dad].*

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17. *When I'm with [Mom/Dad], I feel SAD. How much do* **you** *feel this way?  Not at all, a little bit, some, or a lot* [pointing to each dot in turn]? *Point to one of these dots to show me how SAD you feel when you are with your [Mom/Dad].*

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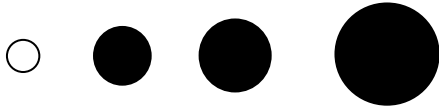
Appendix E: Demographic and Reaction Questionnaire

(1) Child's Name: _____

(2) Child's Gender: _____

(3) Child's Ethnicity: _____

(4) Does your child have normal vision?
    ____Yes
    ____ No (please specify visual problems: _____)
(5) Does your child have normal dental/oral health?
    ____Yes
    ____ No (please specify dental/oral problems:
    _____)
(6) Is your child taking medications?
    ____Yes (please specify medications:
    _____)
    ____ No
(7) Does your child speak fluent English?
    ____ Yes
    ____ No
(8) Do you speak fluent English?
    ____ Yes
    ____ No
(9) Your relationship to the child:
    ____ Mother
    ____ Father
    ____ Other (please indicate relationship_____)
(10) Are you the child's primary/co-primary caregiver?
    ____ Yes
    ____ No
(11) Your occupation: _____

(12) Your years of education:
    ____ Completed graduate degree    ____ College graduate
    ____ Some college, no degree    ____ High school graduate or vocational school
    ____ Partial high school (more than $9^{th}$ grade)
    ____ Junior high school (completed $7^{th}$-$9^{th}$ grade)    ____ Less than seven years of school

(13) Your family income each year:
    ____ Less than 40'000
    ____ 40'000 to 60'000
    ____ 60'000 to 80'000
    ____ 80'000 to 100'000
    ____ More than 100'000

(14) How often do you talk with your child about his/her experiences **that you know little about**?
_____ Rarely or none of the time (less than 1 day a week)
_____ Some or a little of the time (1-2 days a week)
_____ Occasionally or a moderate amount of time (3-4 days a week)
_____ Most or all of the time (5-7 days a week)

(15) How often does your child watch TV or movies?
_____ Rarely or none of the time (less than 1 day a week)
_____ Some or a little of the time (1-2 days a week)
_____ Occasionally or a moderate amount of time (3-4 days a week)
_____ Most or all of the time (5-7 days a week)

(16) The video you and your child discussed was from a Disney animated film:  The Rescuers (1977). How much did you know about this film **before discussing it with your child**?
_____ Nothing (Never heard of the film**)**
_____ Limited (Heard of the film but did **not** know what it is about)
_____ Adequate (Knew what it is about but did **not** know much details)
_____ Very much (Knew a lot of details of the film)

(17) As far as you know, has your child ever seen this film before?
_____ Yes
_____ No

(18) On a scale of 1 to 5 (1=not at all, 5=very much) how much do you think **you** know about the video **now**?

| **Not at all** | | | | **Very Much** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

(19) On a scale of 1 to 5 (1=not at all, 5=very much) how much do you feel **your child** knew about the video?

| **Not at all** | | | | **Very Much** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

(20) On a scale of 1 to 5 (1=not at all upset, 5=very upset) how do you think your child felt about the video?

| **Not at all upset** | | | | **Very Upset** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

Appendix F: Parent-Child Conversation Codes

1. **Emotions (positive, negative, and neutral)** were coded for propositions referring to parent or child's emotions associated with the video, or causes of those emotions. Examples:

> Mother: *"What made you happy?"* [Positive Emotion]
> Child: *"That they found the diamond."* [Positive Emotion]
>
> Mother: *"How did that make you feel*?" [Neutral Emotion]
> Child: *"Sad."* [Negative Emotion]

2. **Character Feelings** were assigned to propositions that referred to characters' emotions or causes of those emotions. Examples:
> Mother: *"Did Penny feel scared?"* [Character Feeling]
> Child: *"A little bit."* [Character Feeling]

3. **Judgments** were coded for propositions referring to parent or child's subjective judgments on character's personality, relationship between characters, or evaluations of an object or event. Examples:
> Child: *"Her mom that wasn't really her mom wanted a diamond."* [Judgment]
> Parent: *"Was that good or bad?"* [Judgment]

4. **Character Appearances** were coded for propositions that referred to character's appearance. Examples:
> Mother: *"What was her hair color?"* [Character Appearance]
> Child: *"Light brown."* [Character Appearance]

5. **Other Facts** were assigned to all propositions that referred to video facts other than character appearances, including parent's general prompts asking for factual information. Examples:
> Mother: *"How did they find the diamond?"* [Other Fact]
> Child: *"By using the sword."* [Other Fact]
>
> Mother: *"What else happened in the video?"* [Other Fact]

6. **Other Associative Talk** was coded for propositions that were related to the film in some ways, but were not captured by any of the previous codes. For example:
> Mother: *"We don't do mean things (like Medusa)."* [Other Associative Talk]

7. **Off – Topic Talk** was coded for propositions that were completely irrelevant to the video, or that provided no information about the video. Examples:
> Mother: *"Don't mess with the cord."* [Off-Topic Talk]
> Child: *"I wanna go home."* [Off-Topic Talk]

Appendix G: Parent-Child Nonverbal Interaction Codes

**1. Parent engagement** assesses the degree to which parent showed attention/interest/enthusiasm on their child's talk.

> **0 = No engagement**.
>
> **1 = Minimum level of engagement**. Parent only showed basic engagement (e.g., nodding head, saying "uh-huh") without any emotional expression.
>
> **2 = High level of engagement**. Parent showed at least one emotional expression in response to the child's talk (e.g., surprised face, laughing).

**2. Parental Warmth** measures how often parent physically touched their child or showed spontaneous positive affect that was NOT in response to the child's talk.

> **0 = No warmth**.
>
> **1 = Minimum level of warmth.** Parent only had one warmth behavior that lasted shorter than five seconds.
>
> **2 = High level of warmth.** Parent had more than one warmth behavior, or only had one warmth behavior but it lasted longer than five seconds.

**3. Parent interruption** assesses how often parent interrupted their child's talk.

> **0 = No interruption.**
>
> **1 = Minimum level of interruption.** Parent only interrupted the child once.
>
> **2 = High level of interruption**. Parent interrupted the child more than once.

**4. Child positive affect** assesses how often child showed positive affective expressions (e.g., smile, laugh).

> **0 = No positive affect.**
>
> **1 = Minimum level of positive affect.** Child only had one positive affective expression that lasted shorter than five seconds.
>
> **2 = High level of positive affect.** Child showed positive affective expression more than once, or showed only one positive affective expression but it lasted longer than five seconds.

**5. Child negative affect** assesses how often child showed negative affective expressions (e.g., frowning, yawning, showing sad, angry, or bored faces).

> **0 = No negative affect.**
>
> **1 = Minimum level of negative affect.** Child only had one negative affective expression that lasted shorter than five seconds.
>
> **2 = Maximum level of negative affect.** Child showed negative affective expression more than once, or showed only one negative affective expression but it lasted longer than five seconds.

**6. Mutual Eye contact** measures how often and for how long the dyad looked at each other.

> **0 = No eye contact.**
>
> **1 = Minimum level of eye contact.** The dyad only looked at each other once and it was shorter than 5 seconds.
>
> **2 = High level of eye contact.** The dyad looked at each other more than once, or there was eye contact lasting longer than 5 seconds.