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## Parental Attachment and Children’s Memory for Attachment-Relevant Stories

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### Abstract

Despite evidence that parents’ attachment is associated with children’s memory, less is known about the mechanisms underlying this association or the contexts in which the association is most meaningful. The present study examined whether parents’ attachment predicted children’s memory for stories about attachment-related topics, whether the cohesiveness of children’s stories mediated the association between attachment and memory, and whether the association varied by interviewer support at retrieval. Five- to 6-year-olds completed attachment-relevant stories while parents provided information about their romantic attachment. Children’s stories were coded for cohesiveness. A week later, children’s memory for their stories was tested by either a supportive or non-supportive interviewer. When the interview was non-supportive, greater parental avoidance was associated with poorer memory, whereas when the interview was supportive, greater parental avoidance was associated with fewer errors. Findings provide insight into the context under which parents’ attachment is most influential in shaping children’s memory.

### Keywords

memory; attachment; interviewer support; narrative cohesiveness

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During the past two decades, a small but impressive set of studies has found that parents’ attachment tendencies are predictive of children’s memory and suggestibility (Alexander, Goodman et al., 2002; Alexander et al., 2010; Chae et al., 2014; Goodman et al., 1997; Melinder, Baugerund, Ovenstad, & Goodman, 2013; Melinder et al., 2010; Quas et al., 1999). In these studies, parental attachment has typically been indexed according to parents’ perceptions of their relationships with romantic partners, that is, parents’ feelings of security versus insecurity (avoidance or anxiety) in close relationships; and children’s memory has been tested for a range of salient, personal and often times arousing or stressful experiences. Results reveal that greater parental avoidance is associated with poorer memory in children, especially as reflected in increased errors and heightened suggestibility and especially when children are recounting a prior stressful or arousing experience (Chae et al., 2014; Melinder et al., 2013; Quas et al., 1999). Similar associations have been reported between parental anxiety and reduced accuracy, though the latter findings are not as consistent as those involving parental avoidance (e.g., Chae et al., 2014; Goodman et al., 1997; Melinder et al.,

2010). Moreover, in some studies, parental anxiety has been linked to increases in how much information children report about prior experiences, although that increase often includes greater amounts of both correct and incorrect details, suggesting that the children are likely simply talking more rather than recalling an event in better detail (Alexander, Goodman et al., 2002).

Despite some relatively consistent findings emerging across studies, researchers have yet to consider in detail why the associations emerge, and why findings sometimes differ between the two forms of parental insecurity: avoidance and anxiety. We sought to address these issues in the present study. We examined the relations between parents' attachment and children's memory for attachment-related stories that the children had created a week previously. The stories, though not stressful per se, were emotionally arousing and hence reflected information that may well be shaped by parents' and children's representations. Of particular interest was whether the cohesiveness of the children's stories mediated the relations between parental attachment and the children's later memory. Also of interest was how the context at retrieval, which was varied by having the interviewer behave in a supportive or non-supportive manner, affected children's memory, directly and in conjunction with parental attachment. Specifically, we investigated whether retrieval context moderated the relations between attachment and memory. Before discussing our research, we review theoretical explanations regarding parental attachment and memory and the potential roles that narrative cohesiveness and retrieval context play in the parental attachment-children's memory associations.

Explanations (Alexander, Quas, & Goodman, 2002; Fivush & Reese, 2002) for the links between parents' attachment and children's memory rely heavily on lifespan models of attachment and the influence of internal working models on perceptions and behaviors (Bowlby, 1969; Hazan & Shaver, 1987; Main, Kaplan, & Cassidy, 1985). According to attachment theory, in infancy, representations or internal working models about the availability of others are gradually formed based on infants' interactions with their primary caregivers. Once formed, these internal working models shape how infants, and later children and even adults, perceive a relationship partner's general availability and support, and how they behave with that partner. Internal working models are particularly important in emotional or challenging situations, during which individuals are most likely to turn to another for support. Individuals' expectations about the availability of others guide individuals' expectations about how much they can rely on others, how much support to expect in return, and how predictable that support is likely to be.

In adults, internal working models influence not only how they interact with their romantic partners, but how they interact with other relationship partners as well, including their children (see Fraley & Shaver, 2000; Mikulincer & Shaver, 2007, for reviews). Adults who report feeling secure in close romantic relationships, for instance, hold expectations that they should be responsive to children. In potentially challenging settings (e.g., teaching, medical procedures), these adults attend to children's needs and help regulate children's emotions (Edelstein et al., 2004; Rholes et al., 1995). Adults who report feeling insecure, especially avoidant, in relationships in contrast hold expectations that children should develop their

own self-regulatory skills, which lead to decreases in adults' tendency to respond with immediate support to their children's emotional displays (Edelstein et al., 2004).

There are several reasons to expect that adults' internal working models and relationship-relevant behaviors may influence children's responses to, understanding of, and memory for prior experiences, particularly those that are stressful or emotionally salient (see Alexander, Quas et al., 2002; Fivush, 2009). For one, when parents and their child encounter an arousing event, parents who tend toward anxious attachment may become aroused themselves, making it difficult for them to attend to their child's needs. Somewhat similarly, parents who tend toward avoidant attachment may limit attention toward their child's response in order to minimize their own feelings of arousal or discomfort (Edelstein et al., 2004). In both cases, the children would need to learn to react to and cope with stress and arousal on their own without considerable guidance from their parents. As a result, these children may learn to avoid talking or thinking about emotional experiences as a means of regulating their own arousal or because they are modeling their parents' avoidant tendencies (Goodman et al., 1997; see Alexander, Quas et al., 2002). Children's need for self-regulation or avoidance of emotional information would be expected to reduce their attention during, and possibly understanding of and later memory for, emotional experiences.

Second, parents' internal working models may indirectly influence children's memory by shaping how parents engage their children in conversations about emotional events and in turn how children learn to talk about those events. Briefly, in a somewhat separate body of research, the ways in which parents talk with their children about the past have been examined extensively and have been linked to variations in how children narrate about personal experiences (see Nelson & Fivush, 2004). Parents who discuss past events more frequently and in more detail by prompting children to elaborate on their statements (i.e., elaborative parents), for instance, have children who are better able to recall past events, as reflected in the children providing a greater amount of information, as well as information that is cohesively and temporally well-organized (Haden, Haine, & Fivush, 1997; Nelson & Fivush, 2000; Principe, DiPuppo, & Gammel, 2013). In contrast, less elaborative or repetitive parents ask primarily closed-ended fact-finding questions about past events. Their children report less information about prior events, and the children's reports are less cohesive (Reese, Haden, & Fivush, 1993). Of note, these differences in children's narratives and memory are evident not only when children are engaged in conversations with their parents, but also when children talk with other adults about past events, suggesting children are learning a general way of talking about events rather than simply responding to their parents' queries (Cleveland, Reese, & Grolnick, 2007; Hedrick, Haden, & Ornstein, 2009). More cohesive reports, as well, often contain higher levels of accuracy than less cohesive reports (Kulkofsky, Wang, & Ceci, 2008), a pattern likely due to greater cohesiveness leading to stronger memory traces used at retrieval.

Turning more specifically to parental attachment, there is reason to predict that such attachment may influence how parents talk to their children about emotional experiences and how children learn to talk about and remember those experiences (see also Fivush, Haden, & Reese, 2006). Parents who are secure may spend a larger amount of time engaged in discussions with their children about negative experiences (Goodman et al., 1997) and more

time helping children understand those events and regulate their arousal. Such discussions could be considered a form of high parental elaboration (Ontai & Thompson, 2002); that is teaching children how to narrative about those experiences in a structured or coherent manner. Insecure parents, in contrast, often minimize discussions of emotional experiences (Goodman et al., 1997) or rather may adopt a low elaborative conversation style when engaged in conversations about emotional or arousing experiences. These children likely learn to avoid talking and possibly thinking about such experiences, leading to a reduction in how organized and detailed they are in their reports and later in the extent and possibly accuracy of their memory (Alexander, Quas, et al., 2002).

Hints at these possibilities emerged in a study by Goodman et al. (1997), who assessed children's memory for an invasive medical procedure that had occurred a few weeks previously. At the time of the interview, parents were asked how they had interacted with their child since the procedure. Parents high on romantic attachment security were more likely to report that they had spent time discussing and explaining the event to their child and had comforted their child afterward than parents low on security (Goodman et al., 1997). Having had these discussions was then positively correlated with the accuracy of children's memory. Through these discussions and with parental support, the children may have been learning how to talk about this emotional experience. They may also have been learning, more generally, how to organize negative emotional information in a cohesive manner for storage and later retrieval (e.g., Bjorklund, 1987; Clubb, Nida, Merritt, & Ornstein, 1993; Fivush et al., 2006). Goodman et al. (1997) however, did not include a measure of the cohesiveness of children's narratives. We did so in the present study, which allowed us to begin to test these ideas. We specifically investigated whether parents' attachment was related to the cohesiveness of children's narratives about mildly arousing stories they had created, and whether this cohesiveness predicted the children's subsequent memory for the stories. Thus, we tested whether narrative cohesiveness mediated the relations between parental attachment and children's memory.

A second issue addressed in our study concerned whether the context at retrieval moderated the associations between parental attachment and children's memory. Independent of parental attachment, numerous prior studies have found that differences in the supportiveness of the retrieval context have implications for accuracy of children's memory (Davis & Bottoms, 2002; Nathanson & Saywitz, 2003). For instance, in some studies, retrieval context has been manipulated by having children questioned in a less intimidating, positive and supportive setting (e.g., a familiar room at school) or a more intimidating, unfamiliar location (e.g., a formal courtroom) (Nathanson & Saywitz, 2003). In others, children have been interviewed by a positive and emotionally supportive versus a neutral and emotionally distant interviewer (Carter, Bottoms, & Levine, 1996; Davis & Bottoms, 2002; Quas, Bauer, & Boyce, 2004). Children are more accurate and less susceptible to false suggestions when questioned in a supportive than non-supportive context (Carter et al., 1996; Goodman, Bottoms, Schwartz-Kenney, & Rudy, 1991; Quas, Wallin, Papini, Lench, & Scullin, 2005; Rush et al., 2013).

In the present study, we tested whether the associations between parents' attachment and children's memory were moderated by the supportiveness of the context at retrieval,

specifically as indexed by differences in interviewer behavior. Regarding parental avoidance, on the one hand, if children of avoidant parents are unwilling to discuss negative events generally (Melinder et al., 2013; Quas et al., 1999), pay less attention to an interviewer, or are used to parents not being available and supportive (e.g., Main et al., 1985), they may not be differentially affected by a supportive versus non-supportive interviewer. On the other hand, however, insofar as these children react to potential threats with heightened arousal and concurrently high self-regulation (Edelstein et al., 2004), they may, when confronted by a non-supportive interviewer, focus internally and fail to attend to the interviewer's questions in sufficient detail. Such would lead to larger negative effects of a non-supportive interviewer on children of parents high in attachment avoidance than on children of parents low in avoidance. Regarding parental anxiety, children whose parents report greater anxiety may have difficulty engaging in conversations about negative events, just as their parents do (Goodman et al., 1997). The children have likely experienced unpredictable or inconsistent reactions by parents, which, when combined with the test-like setting at retrieval and the topic of the questions (i.e., attachment-relevant stories), may lead to heightened anxiety that undermines the children's ability to answer memory questions, regardless of how an interviewer behaves.

To date, one study has examined the effects of interviewer support on memory performance among children of parents more versus less secure in their romantic relationships. Davis et al. (1998, see Bottoms, Quas, & Davis, 2007) found that children of insecure parents made more errors when questioned by a non-supportive than supportive interviewer about a prior play interaction, while children of secure parents did not differ in their tendency to err based on interviewer support. Davis et al. speculated that children of secure parents may have had a greater sense of security themselves or may have more social support reserves, allowing them to maintain attention and respond appropriately to the questions, regardless of whether the retrieval context was supportive or not. However, Davis et al. did not evaluate whether the two forms of insecure attachment (anxious and avoidant tendencies) in parents differentially predicted children's performance in the supportive and non-supportive interviewer conditions. Nor did the researchers examine children's memory for an emotional or arousing event, that is, the type of event most likely to activate the attachment system in the children and hence the type of event for which parental attachment may be especially relevant. We did just this by evaluating how well children remembered potentially arousing attachment-related stories that they had previously created. Interviewers behaved in either a supportive or non-supportive manner and asked both open- and closed-ended questions. This allowed us to assess whether interviewer support moderated the links between attachment and memory in relation to both how much children remembered and the accuracy of their memory.

## Present Study

Five- and 6-year-olds completed a two-session study in our laboratory. The first session was comprised of several laboratory-based challenging tasks, including an attachment-relevant story task (Bar-Haim et al., 2004; Grych, Wachsmuth-Schlaefler, & Klockow, 2002), which subsequently served as the to-be-remembered event. While children completed the story task, we measured their physiological responses (heart rate and respiratory sinus arrhythmia,

or RSA, an index of parasympathetic regulation/withdrawal of the cardiac cycle) to confirm that the stories were indeed arousing. We also coded children's stories for level of cohesiveness. The second session (delay = one week) was comprised of a surprise memory test about the prior session. The memory test included an open-ended prompt and closed-ended questions, which together allowed us to assess the amount (e.g., units of information recalled) and accuracy (e.g., number of correct responses) of children's memory.

For half of the children, the interviewer behaved in a warm and supportive manner, and for the other half, she behaved in an unemotional, cold, and professional manner. Children also completed the Peabody Picture Vocabulary Test (Dunn & Dunn, 1997), a measure of receptive vocabulary, to control for potential effects of verbal ability on their story cohesiveness (Kulkofsky & Klemfuss, 2008; Pearce, James, & McCormack, 2010) and their memory and suggestibility (Bruck & Melnyk, 2004; Clarke-Stewart, Malloy, & Allhusen, 2004). Children's physiological responses were also monitored during the memory interview to evaluate whether children were differentially aroused as a function of whether the interviewer was supportive versus non-supportive. Finally, parents completed a measure of their romantic attachment perceptions.

We predicted that parents' attachment would be related to children's memory for the stories, with both forms of insecure parental attachment being related to poorer memory performance, and parental avoidance specifically being related to increases in children's tendency to err (Alexander, Goodman et al., 2002; Chae et al., 2014; Goodman et al., 1997; Melinder et al., 2013; Quas et al., 1999). We also expected both forms of insecure parental attachment to be related to less cohesive stories by children, and less cohesive stories in turn to be related to poorer memory (e.g., Cleveland et al., 2007; Hedrick et al., 2009). In other words, we hypothesized that cohesiveness would mediate the relation between insecure parental attachment and children's memory.

Turning to retrieval context, we predicted a main effect of interviewer support: Children questioned by a supportive interviewer were expected to make fewer errors than children questioned by a non-supportive interviewer (e.g., Davis & Bottoms, 2002; Goodman et al., 1991; Quas et al., 2005). We also anticipated that interviewer support would moderate the associations between parental attachment and children's memory. We expected children of parents higher in attachment avoidance to be more strongly (negatively) affected by the non-supportive interviewer than children of parents lower in attachment avoidance (Davis et al., 1998), given that the former children may react to potential threats by focusing internally and failing to attend to the interviewer's questions in sufficient detail. However, we also tested an alternative hypothesis, namely that children of more avoidant parents would be unaffected by interviewer support because they are used to parents not being available and supportive (e.g., Edelstein et al., 2004) and may not attend to the interviewer's questions regardless of her behavior.

Finally, with regard to parental attachment anxiety, although it is possible that children of parents high in anxiety might also be more adversely affected by a non-supportive interviewer than children of parents who tended toward greater security, the former children might have difficulty regardless of the interviewer's behavior. This may be due to the

children's prior experiences with unpredictability in their parents' reactions and behaviors (e.g., Goodman et al., 1994) and to the retrieval activity itself being a test, which could be anxiety provoking irrespective of context (Dan, Bar Ilan, & Kurman, 2014).

## Method

### Participants

One hundred and seventeen 5- to 6-year-olds ( $M = 72.98$  months, range = 60 to 83 months), 59 males, and a parent served as participants. This age range of children was selected so that results could be directly compared to other studies of attachment and memory in children (Alexander, Goodman et al., 2002; Chae et al., 2014; Melinder et al., 2010; Quas et al., 1999), and because the story stem task was developed for this age range (Oppenheim, Emde, & Warren, 1997; Schechter et al., 2007). Participants were taking part in a larger study of physiological stress reactivity, memory, and context (Quas & Lench, 2007; Quas et al., 2005). Ethnicity varied: Caucasian (57%), Hispanic non-Caucasian (7%), Asian American (6%), African American (4%), multiethnic (19%), and unknown (7%). Most parent participants were mothers (80%), married/in a long-term relationship (87%), made over \$60,000 a year (62%), and were well educated (48% had at least a 4-year college degree).

Families were recruited from a database of parents interested in research, advertisements at childcare facilities, a local marketing firm, and word-of-mouth. Children were free from serious medical conditions and fluent in English. One child per family participated.

### Materials and Procedure

Parents were contacted via phone and the study was briefly explained. An initial session at a child development laboratory was scheduled for parents who wished to take part. The study was approved by the University of California, Irvine, Institutional Review Board.

**Session 1**—Upon arrival, the study was explained to parents. They were not, however, told of our interest in memory or about the interviewer support manipulation at session 2, as we did not want parents rehearsing information or preparing their children for a non-supportive interviewer. Parents' written consent and child verbal assent were obtained.

Parents completed a brief demographic questionnaire concerning the child's age, ethnicity, and gender; and their education and income. Parents also completed the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), a widely used measure of adults' general relationship tendencies. The RQ includes four short paragraphs, each describing a prototypical attachment pattern (i.e., secure, preoccupied, dismissing, and fearful avoidance)<sup>1</sup> as it applies to individuals' perceptions of their romantic relationships.

Respondents rate their similarity to each pattern on a 7-point scale (1- "not at all like me"; 7-

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<sup>1</sup>These terms reflect the original terms used in the Relationship Questionnaire (Bartholomew & Horowitz, 1991). For ease of interpretation, for consistency across the attachment literature, and to ensure direct comparisons to former studies of parental attachment and children's memory, in the present manuscript, we use secure, anxious, ambivalent, and avoidant; respectively. The patterns described in the RQ and the labels we use refer to similar attachment representational tendencies (Alexander, Goodman et al., 2002; Bartholomew & Horowitz, 1991; Fraley & Shaver, 2000).

“very much like me”). The RQ has been shown to have good test-retest reliability and validity (Scharfe & Bartholomew, 1994).

While parents completed the questionnaires, the child was escorted to a separate room where a male researcher was waiting. A female researcher who had built rapport with the child introduced physiological equipment that would monitor the child’s autonomic response to the session. This enabled us to gain insight into children’s level of arousal as each story was being completed rather than via a self-report measure completed after all of the stories were finished. The equipment included a respirometer belt, placed around the child’s abdomen to obtain continuous respiration data, and three spot electrodes, connected to a BIOPAC MP100 (BIOPAC Systems Incorporated, Santa Barbara, CA) to collect continuous heart rate and respiratory sinus arrhythmia (RSA) data, both markers of autonomic arousal used in prior studies of children’s responses to laboratory tasks (Boyce et al., 1995; Davies, Sturge-Apple, Cicchetti, Cummings, 2008; El-Sheikh et al., 2009; Gunnar, Frenn, Wewerka, van Ryzin, 2009; Salomon, Matthews, & Allen, 2000).

Once the equipment was in place, the male researcher had the child complete several tasks. First, he read the child a 3-minute neutral story to calm the child and ensure he/she was comfortable. Then he administered a widely-used laboratory stress protocol for 4–8 year-olds (Alkon et al., 2003; Boyce et al., 2001; Essex, Armstrong, Burke, Goldsmith, & Boyce, 2011), comprised of several 1–3 minute mildly challenging tasks (i.e., a brief social interview, a digit span task, an unfamiliar substance taste test, and brief video clips, one sad, one fearful, and one happy). Although the stress protocol itself is not relevant to the present study’s to-be-remembered event, it is important to understand the tasks, as the entire session was comprised of activities designed to be arousing to children within this age range (see Quas & Lench, 2007, and Quas et al., 2005, for more details). Because the laboratory protocol was challenging, immediately after the tasks were completed, the researcher read a second 3-minute neutral story to calm the child. In this way, arousal induced by the protocol was minimized.

Next, and of primary interest in the present study, the child completed the story completion task (George & Solomon, 1990), a modified version of the MacArthur Story Stem Battery (Bretherton, Oppenheim, Buschbaum, & Emde, 1990; Emde, Wolf, & Oppenheim, 2003). The male researcher presented the child with a set of dolls and asked the child to choose dolls for a pretend family. After the child selected the dolls (all children did so), the researcher allowed the child to engage in 2–3 minutes of free play with the dolls and a toy house. Next, he presented beginnings of four stories (“stems”) in a set order: (1) the family finding a pet, (2) the child’s parents leaving on a trip (separation), (3) the child’s parents returning from the trip (reunion), and (4) the child fearing a monster under the bed at night. He then asked the child to finish the story. He let the child talk until he/she paused and then followed with non-specific prompts (e.g., “Does anything else happen?”) until the child said nothing else happened. The story completion task lasted approximately 15 minutes and was videotaped. Physiological data were collected continuously during the stories. The researcher read final, neutral story to ensure the child was calm.

At the end of the session, the child and the parent were reunited and thanked. The parent was asked to avoid discussion of the session until after the second visit.

**Session 2**—Following a one-week delay ( $M = 7.20$ , range = 4 to 14 days), the parent and child returned to the laboratory for a surprise episodic memory test about the prior visit. Children were randomly assigned to either the supportive ( $N = 62$ ) or non-supportive ( $N = 55$ ) interviewer conditions, with an approximately equal distribution of age and gender across the two conditions. Parents were informed of our interest in their child's memory and were given the interview questions to review. All parents approved of the questions. A female researcher then escorted the child to a new room for the interview. She placed the physiological equipment on the child in a manner identical to that in the first session. This allowed us to collect measures of children's autonomic arousal before and during the memory test. The researcher read a neutral story to ensure the child was calm. Then, a female interviewer, who had not met the child previously and was blind to the study's hypotheses, entered (all interviewers conducted some supportive and some non-supportive interviews).

The interviewer behaved in either a supportive or non-supportive manner following procedures successfully employed in prior studies (Davis & Bottoms, 2002; Goodman et al., 1991; Quas et al., 2004) which were based on classic research concerning perceived support in interpersonal contexts (e.g. Mehrabian, 1968). In the supportive condition, the interviewer introduced herself and sat close to and facing the child. She built rapport for 2 minutes by asking the child questions about her/his day and then proceeded with the memory questions. Throughout the interview, she sat with an open body posture, smiled, maintained eye contact, and provided verbal encouragement at proscribed times. In the non-supportive condition, the interviewer entered, and sat three feet from the child. She did not introduce herself and quietly reviewed papers for 2 minutes. If the child spoke during this time, she briefly explained that she would begin in a few moments and returned to her paperwork. Throughout the interview, she maintained minimal eye contact, did not smile, and talked in a monotone voice. Although she asked for clarification when necessary, she did not provide any feedback to the child about her/his performance.

In both conditions, the interviewer explained that she needed to ask about the last time the child was at the laboratory, that the child should answer as best as possible, but the child could say "I don't know" if she/he forgot an answer. The interviewer then asked questions about the entire previous session (see Quas & Lench, 2007; Quas et al., 2005; for details). Of interest here were 21 questions about the four story stems. Two were open-ended, probing for detailed recall narratives from children (e.g., "Tell me everything you remember about the stories you told") and 19 were closed-ended, probing for specific details about stories. Because children's individual stories varied, the closed-ended questions were designed to apply to the entire story task, regardless of the content or length of the original individual story responses (e.g., questions asked whether the child used a house to tell the stories, who picked the dolls, how many dolls were picked, etc.). Within the closed-ended questions, correct answers included an approximately equal number of "yes", "no", and single-word answer responses to avoid response biases. Finally, seven closed-ended questions were misleading (with "yes", "no", and single-word answer types all represented) in that they

explicitly suggested incorrect details or an incorrect answer via tag clauses (e.g., “[researcher’s name] didn’t let you pick out your own family, did he?”).

After the questions, the interviewer left. The researcher returned and administered the Peabody Picture Vocabulary Test (PPVT-IV; Dunn & Dunn, 1997), a widely used standardized test of receptive vocabulary understanding. The child’s age equivalent score was included as an index of verbal ability (Clarke-Stewart et al., 2004; Roebbers & Schneider, 2005). At the end of the session, the child was fully debriefed, including about the interviewer’s behavior. The child and parent were thanked, the parent was given an honorarium, and the child received a small toy.

### Data Reduction and Coding

Parents ratings of their similarity to four patterns (secure, avoidant, anxious, and ambivalent) on the 7-point scales (1- “not at all like me”; 7- “very much like me”) from the RQ were coded into two dimensions, one reflecting anxiety about the self in relationships and the other reflecting avoidance of others in relationships, using procedures described by Griffin and Bartholomew (1994; see also Bartholomew & Horowitz, 1991). For the anxiety scale, scores for the two patterns indicative of negative evaluations of the self (anxious and avoidant) were summed and subtracted from the sum of scores for the two patterns indicative of positive self-evaluations (secure and ambivalent). For the avoidance scale, scores for the two patterns indicative of avoidance of others (ambivalent and avoidant) were summed and subtracted from scores for the two patterns indicative of positive evaluations, or non-avoidance, of others (secure and anxious). The scale scores were then reversed such that higher scores were reflective of greater anxiety and avoidance in relationships (see Fraley & Shaver, 2000, for an extended discussion of the two dimensions).

Children’s story stem narratives, physiological responses, and memory responses were coded separately. Children’s story narratives were scored by three trained coders to establish reliability. Once this was achieved and discrepancies were resolved, two of the coders scored the remaining narratives. For the physiological data, reliability was established between two coders, discrepancies were resolved, and one coder scored the remaining data. Finally, memory responses were scored by two coders until reliability was established. After discrepancies were resolved one coder scored the remaining responses. Coding teams were different across the three types of measures. For the narratives, physiological responses, and memory measures, reliability was established on 10–18% of the participants across conditions. Proportion agreement ranged from .88 to .91 for the narrative story stem and memory variables, and the intraclass correlation coefficient (ICC) between the coders’ scores on the physiological data was nearly perfect, ICC = .99.

Children’s story stem narratives were each scored separately using a 4-point system modified from the MacArthur Narrative Workgroup (Oppenheim et al., 1997) for general connectedness and clarity, labeled cohesiveness. High scores corresponded to logical stories that contained sequential series of events and a resolution of the issue posed by the story stem, consistent with prior scoring systems. Lower scores are given for stories that excluded some or all of these components (Bar-Haim et al., 2004; Grych et al., 2002; Oppenheim et al., 1997). For example, in the separation story, a code of “0” was given if the child did not

acknowledge that the parents left; while a code of “3” was given if the child described the doll seeking a supporting other because the parents left. From the individual story scores, a mean cohesiveness score was computed by averaging the separation, reunion, and monster prompt scores (the pet story was not included given that children’s arousal was lower during this story than during the other three, see below for details).

Minute-by-minute heart rate and respiratory sinus arrhythmia (RSA; a cardiac marker of parasympathetic responses) data were collected during both sessions. The data were cleaned and edited for artifact using Mindware by researchers who had extensive training and had attended Mindware training seminars (Westerville, OH, 2002). For session 1, averages were calculated for heart rate and RSA during each story stem. For session 2, averages were calculated for the memory interview and the calming story read at the start.

Children’s session 2 memory responses to the open- and closed-ended questions were coded separately. Open-ended responses were scored for units of correct and incorrect information using coding systems developed for and used in prior studies (see Davis & Bottoms, 2002; Goodman et al., 1991; Poole & Lindsay, 1995; Quas & Lench, 2007). Units were defined as any agent, action, or object that conveyed unique details about the story. Details were scored once, and only verifiable factual information was included. Correct and incorrect units were summed separately. Incorrect details were rare ( $M = .84$  units, range = 0 to 14) and are not considered further.

Closed-ended responses were coded as correct, commission error (i.e., providing false details), omission error (i.e., omitting true details), don’t know, or unscorable (i.e., unverifiable). Proportions were computed by dividing the number of each type of response by the number of questions asked. Do-not-know and unscorable responses constituted 4% and 2%, respectively, of children’s answers and are not considered further. Proportion scores were also calculated separately for the non-leading and misleading closed-ended questions. Correct responses and commission errors for the two question types were significantly correlated,  $r_s > .36$ . Because some non-leading questions asked about details that did not occur and hence could still be considered leading, and because few findings varied when the two types of questions were analyzed separately, they were collapsed in the analyses.

## Results

Preliminary analyses examined potential confounds and covariates, tested whether the stories were arousing and whether the interviewer support manipulation was perceptible and effective, and evaluated the data for outliers and normalcy. The main analyses investigated the relation between parental attachment and children’s memory, whether story cohesiveness mediated this relation, and whether the relation differed based on interviewer support.

### Preliminary analyses

Correlations and t-tests revealed that delay between sessions and gender were unrelated to measures of interest in the study;  $r_s < .07$ ,  $t_s(95-116) < .27$ , *n.s.* Neither is considered further.

To test whether the story-stems were arousing and possibly evoked attachment issues, repeated-measure analysis of variances (ANOVAs) were conducted comparing children's mean heart rate and RSA across the stories: pet, separation, reunion, and monster. The model was significant for heart rate,  $F(3, 243) = 6.45, p < .01, \eta^2 = .07$ . Post hoc comparisons revealed that children's mean heart rate was higher during the separation, reunion, and monster stories ( $M_s = 95.40\text{--}96.06$ ) than the pet story ( $M = 94.48$ ), post hoc  $p_s < .05$ .

Even though the post-hoc comparisons suggested that the three stories highly relevant to attachment-themes (separation, reunion, and having a monster under the bed) were the most arousing to children, all stories had been presented in the same order. Accordingly, the increase in arousal could have been due to increases in children's activity level over time rather than to the stories' content per se. Therefore, an additional 12 participants (mean age = 77.33 months) were tested. They completed the entire first session in a manner identical to the other children, including the standardized laboratory stress protocol, the neutral stories, and the story stem task. The only difference was that the order of the story stems varied such that the pet story came last. The separation prompt still came before the reunion prompt, as this made more sense logically. Children's heart rate during the separation, reunion, and monster stories remained significantly higher ( $M_s = 97.16\text{--}98.45$ ) than during the pet story ( $M = 94.39$ ),  $F(3, 27) = 4.21, p = .01, \eta^2 = .42$ . Thus, order effects did not account for the trends.

To ensure that the interviewer support manipulation was effective, interviewers' behaviors were evaluated by naïve raters who scored each interviewer on 4-point scales (1 = non-supportive, 4 = supportive). Scores significantly differed between the supportive,  $M = 2.54$ , and non-supportive,  $M = 1.12$ , conditions,  $t(99) = -9.08, p < .01$ . When children's physiological arousal during the interview conditions was examined via 2 (activity: memory interview v. listening to story)  $\times$  2 (support condition) ANOVAs, with heart rate and RSA entered in separate analyses, however, the effect of support condition was not significant,  $F_s(1, 98) = 1.03, n.s$ . The effect of activity was significant, with children having higher heart rates and lower RSA (indicative of greater parasympathetic withdrawal) during the interview than while listening to the neutral story,  $F_s(1, 98) = 6.46, p_s < .01, \eta^2_s = .06$ . This pattern may be due to the fact that talking is often associated with an increase in arousal.

Finally, the main study variables were examined for skewness and normalcy (see Table 1 for all raw scores). None of the independent measures (parental attachment, children's story cohesiveness, children's PPVT age equivalent scores) was significantly skewed. Open-ended responses were positively skewed (skewness = 2.4; kurtosis = 8.1) and were thus log transformed prior to their inclusion in the main analyses. Correlations among the study variables are also presented in Table 1. As is evident, cohesiveness and parental attachment were not significantly correlated. Thus, cohesiveness could not mediate relations between parental attachment and children's memory, and mediational analyses were not performed.

### Main Analyses

The study's main hypotheses were tested via linear regressions. Dependent measures included the amount of correct detail children provided to the open-ended prompts, and

children's proportion of correct responses and commission and omission errors to closed-ended questions. In Model 1, predictors included children's PPVT age equivalent scores and support condition; the former a covariate that needed to be taken into account before we examined parental attachment and children's story cohesiveness. In Model 2, parents' two attachment scores (avoidance and anxiety) and children's story cohesiveness were added. Finally, in Model 3 the avoidant attachment by support and the anxious attachment by support interactions were entered to test our predictions concerning the moderating role of interviewer support on the associations between parental attachment and children's memory. Variables were centered prior to inclusion per Aiken and West (1991).

When the summed number of units of correct details provided to the open-ended prompts was examined (Table 2), Models 1, 2, and 3 were significant,  $F(7, 66) > 2.22$ ,  $ps < .04$ , though the  $R^2$  was non-significant for Models 2 and 3. Only children's PPVT scores emerged as a statistically significant predictor, with higher PPVT scores being associated with children providing a greater number of correct details in their open-ended responses.

Next, children's correct responses to closed-ended questions were investigated. Models 1 and 3 were significant, as was the  $R^2$  at Model 3,  $F(7, 68) = 3.23$ ,  $p < .01$ ,  $R^2 = .12$ . Children's PPVT, the avoidant attachment by support interaction, and the anxious attachment by support interaction emerged as significant predictors of children's correct responses. Higher PPVT scores were associated with children providing a greater number of correct responses to the closed-ended questions. Second, the avoidant attachment by support interaction was plotted in Figure 1: In the non-supportive condition, increases in parents' tendency toward attachment avoidance were related to decreases in the proportion of correct responses provided by children, slope  $r = -.33$ ,  $p = .05$ , whereas in the supportive condition, parents' tendency toward attachment avoidance was unrelated to children's correct responding, slope  $r = .20$ , *n.s.* (the two slopes differed significantly,  $z = 2.15$ ,  $p = .03$ ). The anxiety attachment by support interaction was also plotted in Figure 2; however, this was largely for heuristic reasons. The slopes in the non-supportive and supportive conditions did not significantly differ,  $z = 1.81$ ,  $p = .07$ , and neither was statistically significant (in the non-supportive condition,  $r = .17$ ; in the supportive condition,  $r = -.28$ ).

For commission errors, Model 3, which included all variables and interactions, was significant,  $F(7, 68) = 2.96$ ,  $p < .01$ ,  $R^2 = .14$  (Table 4). The avoidant by support interaction was significant,  $B = .39$ ,  $p < .01$ . The pattern that emerged, plotted in Figure 3, suggested, more robustly than for correct responses, that the interviewer's behavior exerted a stronger influence on children whose parents were higher rather than lower in avoidance, as predicted. In the non-supportive condition, increases in parents' tendency toward attachment avoidance were associated with increases in children's commission errors,  $r = .46$ ,  $p < .01$ , whereas, in the supportive condition, parental avoidance was related to decreases in children's errors,  $r = -.34$ ,  $p = .04$ . A z-test confirmed that the slopes significantly differed,  $z = 3.35$ ,  $p < .01$ .

Finally, when omission errors were examined, the model was significant only at Model 1,  $F(2, 73) = 4.32$ ,  $p = .02$ . Higher PPVT age equivalent scores were associated with decreases in children's omission errors,  $B = -.33$ ,  $p < .01$  (Table 5).

## Discussion

The overarching goals of the present study were twofold: to evaluate potential reasons for the commonly observed relations between parental attachment and children's memory, namely whether narrative cohesiveness mediated the relations; and to test whether the relations varied across retrieval contexts. Overall, our findings extend former research by highlighting that the associations between insecure attachment in parents and poorer memory in children obtained previously (Alexander, Goodman et al., 2002; Alexander et al., 2010; Chae et al., 2014; Goodman et al., 1997; Melinder et al., 2013; Melinder et al., 2010; Quas et al., 1999) differed depending on whether children were questioned in a supportive or non-supportive manner. Moreover, our findings were most robust when parental avoidance was considered, consistent with attachment theory (Bowlby, 1969) and prior research (Alexander, Goodman et al., 2002; Goodman et al., 1997).

When the interview context was non-supportive, greater parental avoidance was predictive of reduced accuracy, as reflected in both a decrease in children's correct responses and an increase in errors to closed-ended questions. The errors consisted of children providing false information rather than omitting true details, a pattern similar to that reported in previous studies (e.g., Goodman et al., 1997). In contrast, when the interview context was supportive, parental avoidance was unrelated to correct responses and, unexpectedly, a reduction in commission errors. Stated another way, children of parents who tended toward higher rather than lower attachment avoidance seemed to be more influenced by variations in the retrieval context.

There are several explanations for the observed patterns of results. For one, children of avoidant parents may well be more sensitive to others' behavior in dyadic interactions (Goodman et al., 1997; van Ijzendoorn et al., 1991), leading these children to perform poorly in the non-supportive condition but fairly well in the supportive condition. The children may not have parents who provide consistent support, requiring that the children pay close attention to others' behavior in order to know how to respond. When the interviewer was supportive, they may have been able to attend to the questions and avoid errors. When the interviewer was non-supportive, perhaps they disengaged, leading to less attention being directed to the precise questions being asked and a subsequent increase in errors. Second, it could be that children whose parents tended toward avoidant attachment were uncomfortable interacting with an unfamiliar adult who was cold or emotionally unavailable, leading them to feel compelled to answer questions while concurrently regulating their own arousal (Davis et al., 1998). In other words, they may have felt pressure to answer questions even when they did not know the answer. In the supportive condition, perhaps the children were better able to pay attention to questions, which helped them avoid errors. Children of secure parents, in contrast, may have a greater sense of security themselves or may have greater social support reserves on which they could rely regardless of whether the interviewer was supportive or not (Alexander, Quas, et al., 2002). This reliance may have made them less perturbed by the non-supportive interviewer, but also may have increased their tendency to err (at least relative to children of parents who tended toward greater avoidance) in the supportive condition. Third and finally, perhaps children of avoidant parents were simply unwilling to discuss a prior attachment-relevant event or answer questions posed by a non-

supportive adult, whether they remembered the event or not, but they were willing to do so with a supportive adult. Children of parents who tended toward greater security, again, may simply have been more willing to talk about the event regardless of interviewer support. Regardless of the reasons, our finding that certain children, in this case those with parents who tended toward greater avoidance, are more strongly affected by variations in context is consistent with other literatures suggesting that individual differences in children's sensitivity to context influence specific developmental outcomes (Boyce & Ellis, 2005; Quas et al., 2004).

Findings hinted at differences in the association between parental attachment anxiety and children's memory in the supportive condition compared to the non-supportive condition. However, follow-up analyses revealed that the slopes between parental anxiety and children's correct responses were non-significant when analyzed separately in the supportive and non-supportive interview conditions. Thus, we hesitate to interpret the meaning of this trend without further research.

Three other points are important with regard to the current study's findings. One concerns our findings that children's overall narrative productivity was unrelated to parental attachment, and as already mentioned, in the supportive condition, increases in parental avoidance predicted fewer commission errors by children. Together, these trends suggest that parental attachment played a role in children's *willingness* to retrieve or talk about attachment-related information, not their encoding or storage of that information. Had encoding been affected, children of parents higher in avoidant attachment should not have performed well in the supportive condition and should likely have made a high number of errors. Other research and theorizing, in contrast, suggests attachment (both parental attachment and individual's own attachment) may influence how well individuals encode attachment-related information (see Alexander, Quas, et al., 2002; Fraley, Garner, & Shaver, 2000; Kirsh & Cassidy, 1997). Insecure individuals, across age, are believed to encode less information than secure individuals in attachment-relevant stressful situations due to the former shifting their attention away from attachment-relevant information (Bowlby, 1980, 1987). Prior studies with children have demonstrated some differences in children's processing of attachment information (Kirsh & Cassidy, 1997; Main et al., 1985). Such patterns however were not evident here. We are unsure as to whether differences across studies in the content of the to-be-remembered material or the autobiographical nature of the memory task contributed to variable findings. Additional research, with multiple types of attachment-related to-be-remembered stimuli and varying delay intervals, may help tease apart whether and when encoding and/or retrieval effects underlie differences in memory and how context further contributes to these effects.

Second, unlike our results that suggested parental attachment predicted errors only in certain contexts, prior research has found that parental attachment predicts children's memory errors even when an interviewer is not explicitly attempting to be neutral or cold (Alexander, Goodman et al., 2002; Chae et al., 2014; Goodman et al., 1997; Melinder et al., 2013; Quas et al., 1999). In prior studies, though, children were often being asked to recount highly stressful situations, such as a painful medical procedure (Alexander, Goodman et al., 2002; Goodman et al., 1997; Quas et al., 1999). The act of retrieving memories of distressing

experiences itself may induce arousal, especially for children of parents who tend toward greater insecurity in their attachment representations. Arousal at retrieval is known to decrease memory performance (Almerigogna, Ost, Akehurst, & Fluck, 2008; Quas & Lench, 2007; Rush et al., 2013). In the present study, children were asked to recall story narratives that they had previously made up. Although the stories concerned attachment-relevant topics and were mildly arousing, as suggested by slight increases in children's heart rate responses, the stories did not involve personal threat or harm. Whether interviewer support would interact with parental attachment when children are recounting salient prior stressful events is unknown, but important to explore in future research.

Third, the cohesiveness of children's stories was unrelated to parental attachment and to children's memory, and thus did not serve as a mediator, in contrary to our hypothesis. We were surprised that the cohesiveness of children's narratives was unrelated to parental attachment, given that parental attachment influences how parents talk with children about prior arousing experiences and children's reactions to those experiences, though research that has revealed these trends has largely concerned experiences considered highly distressing (e.g., medical; Alexander, Goodman et al., 2002; Goodman et al., 1997; Quas et al., 1999). However, parental attachment has also been linked to parents' interactions with their children during structured teaching settings (Rholes et al., 1995). Had parents administered the stories in the present study, perhaps the parents' interactive style would have directly related to children's narratives.

Related, we were surprised that children's story cohesiveness was unrelated to their memory in light of prior work that has revealed associations between narrative cohesiveness and both memory completeness and accuracy in children (e.g., Cleveland et al., 2007; Hedrick et al., 2009; Fivush, Haden, & Adam, 1995; Kulkofsky & Klemfuss, 2008; Kulkofsky et al., 2008). In prior work, however, cohesiveness has been coded in relation to children's narratives about *past* events, that is, how cohesively children talk about a former experience when given open-ended prompts. In the present study, children's narratives themselves served as the to-be-remembered event, and those same narratives were coded for cohesiveness. Had we collected extensive memory narratives at retrieval, we may have been able to code for cohesiveness of children's actual memory reports and perhaps found cohesiveness predicted the recall. In a recent investigation, Wang, Bui, and Song (2015) examined young children's memory for a story that they had made up 6 months prior. Children's story was coded for coherence (similar to our "cohesiveness" score) and organization (e.g., complexity, temporal markers). Unlike the results of the present study, story coherence was positively related to the amount of information children later recalled, but not to the accuracy of that information. Other aspects of narrative organization (e.g., complexity), though, did predict accuracy. Had we obtained lengthier narratives from children, we might have been able to code for other organization characteristics. In the future, therefore, multiple facets of narrative organization and possibly other types of narrative content (e.g., emotion words) should be examined to assess not only how they are related to memory, but also whether they vary as a function of parental attachment and account for some of the commonly observed links between attachment and memory.

## Limitations and Future Directions

Although the present study was unique in its efforts to test both potential mediators and moderators of the association between parental attachment and children's memory, the study is not without limitations. For one, as in prior research in this area, children were not randomly assigned to parental attachment or story cohesiveness conditions. Thus, the *effects* of attachment and cohesiveness on memory could not be ascertained. However, because interviewer behavior was manipulated, we were able to draw conclusions about the moderating role of context at retrieval. That is, our work highlights the contexts in which the associations between parental attachment and children's memory are likely to be most meaningful.

We also relied on the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991) to measure parental attachment, a measure no longer considered the gold standard in the adult attachment literature as an index of romantic attachment tendencies. However, the measure has been recently included in similar studies (see Melinder et al., 2013), and thus, we are able to compare our findings to research concerning children's memory. Future studies would benefit from the inclusion of multiple measures of attachment (e.g., the Experience in Close Relationships; ECR; Brennan, Clark, & Shaver, 1998) for greater precision tapping the anxiety and avoidance attachment tendencies in parents and also in children.

Finally, we included the attachment story stems as the to-be-remembered event for several reasons. The story stems have been shown to activate the attachment system (Bar-Haim et al., 2004; Grych et al., 2002; Oppenheim et al., 1997) and did so here as well, at least as indexed via increases in children's heart rate. Also, although the content of individual children's stories varied, the story stem prompts themselves were standardized. Thus, we could compare memory responses across children. Future research, as mentioned, should expand the types of to-be-remembered events to include both even more structured and highly individualized personal experiences, such as parents and children co-narrating a past attachment-relevant episode. The extent to which findings converge across different to-be-remembered events would provide important insight into mechanisms that contribute to significant findings. We also measured parents' romantic attachment, consistent with prior studies, and with some theorizing about its role in shaping children's attention during, reactions to, and memory for emotional experiences (Alexander, Quas et al., 2002). However, children's own attachment patterns also likely shape their emotional responses and memory (Belsky, Spritz, & Crnic, 1996). Children high in avoidance, for instance, may have been unwilling to discuss the arousing stories. Insofar as both children's own attachment tendencies and those of their parents can be examined concurrently, their unique and joint contributions to memory (encoding and retrieval) can be discerned.

## Conclusions

The present results provide new insight into the relation between parental attachment and children's memory. The findings indicate the importance of context in the relation between parental attachment and children's memory; most notably retrieval context may differentially relate to children's memory, especially for children with insecurely attached parents. These findings, along with the existing work on attachment and memory, and future

work extending the present results, have the potential to tell a meaningful story about the ways in which context, and interviewer behavior more specifically, influences children's memories.

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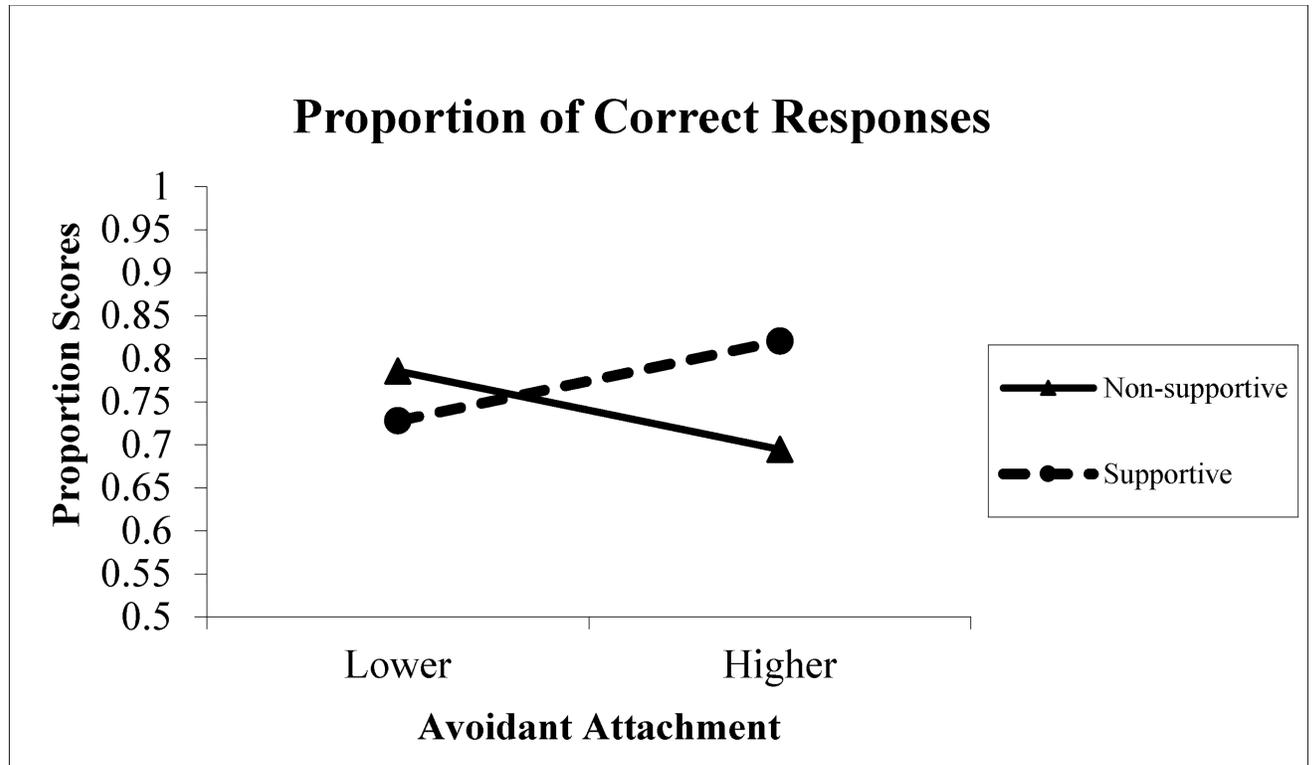
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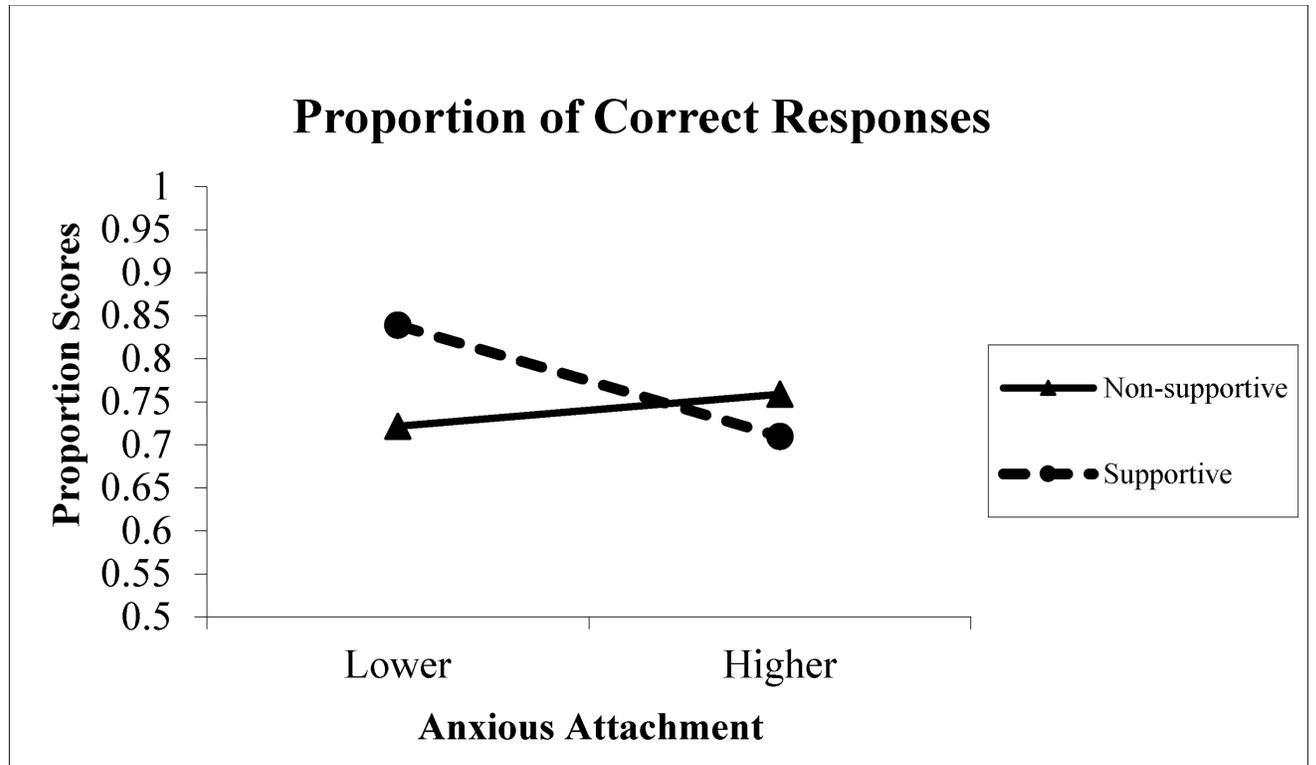
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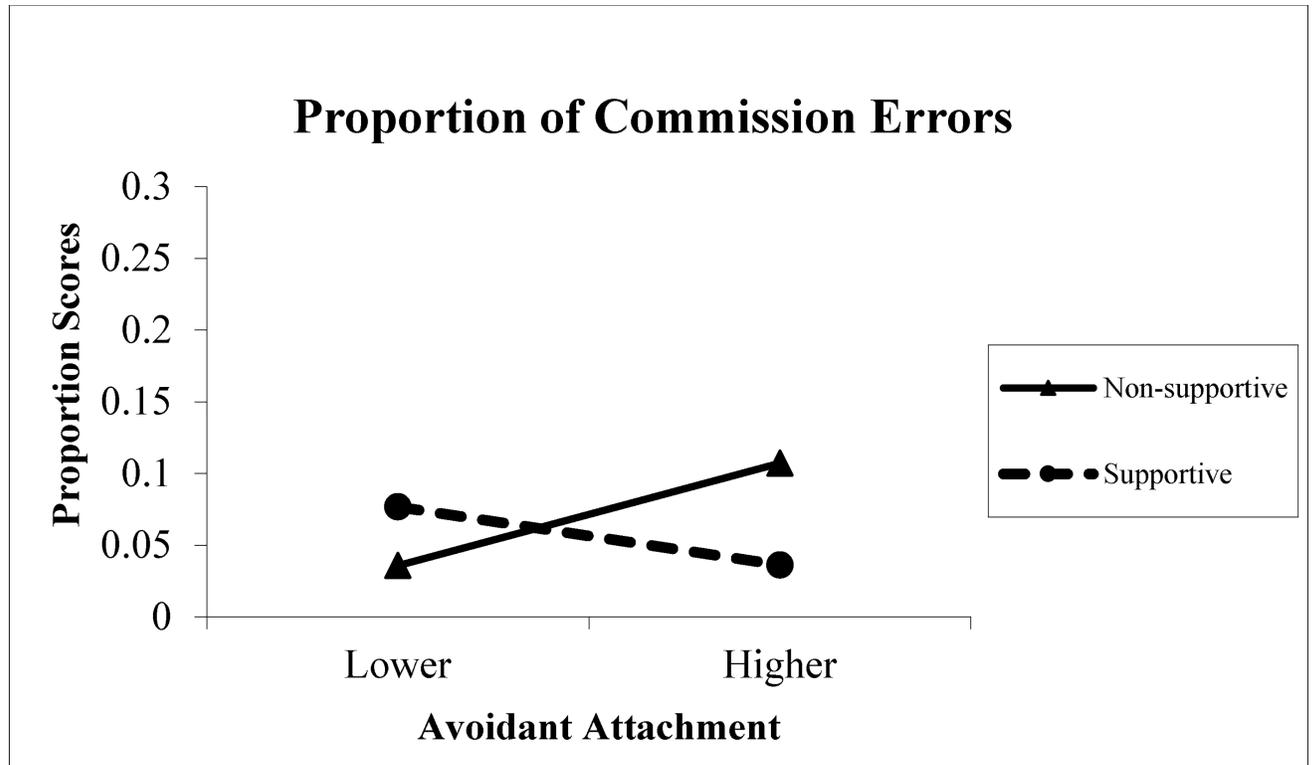
**Figure 1.**

Plot of the interaction between avoidant parental attachment and support condition for children's correct responses. The end points show different directions of trends one standard deviation below and above the means among children questioned in the supportive and non-supportive conditions.



**Figure 2.**

Plot of the interaction between anxious parental attachment and support condition for children's correct responses. The end points show different directions of trends one standard deviation below and above the means among children questioned in the supportive and non-supportive conditions.



**Figure 3.** Plot of the interaction between avoidant parental attachment and support condition for children's commission errors. The end points show different directions of trends one standard deviation below and above the means among children questioned in the supportive and non-supportive conditions.

**Table 1**

Descriptive statistics of and correlations between study variables

Variable	N	M	SD
PPVT Age Equivalent in Months	109	79.67	12.12
Cohesiveness	104	1.66	.63
Parent Attachment			
Avoidant	115	-1.40	3.99
Anxious	115	-3.47	3.77
Story Memory Performance			
Open-Ended Responses Correct	115	8.11	10.35
Correct Responses	117	.75	.17
Commission Errors	117	.07	.09
Omission Errors	117	.09	.07

	Anxious Attachment	Avoidant Attachment	Cohesiveness	PPVT
Parental Attachment				
Avoidant	1	.11	-.08	.06
Anxious	--	1	-.04	-.02
Cohesiveness	--	--	1	.12
PPVT	--	--	--	1
Memory				
Open-Ended Responses Correct	-.12	-.09	.15	.26*
Correct Responses	-.11	.02	.09	.36*
Total Errors	-.06	-.05	.04	-.35*
Commission Errors	-.07	.06	.08	-.29*
Omission Errors	-.01	-.16	-.04	-.25*

\*  $p < .05$ .

**Table 2**

Regression results predicting children's amount of correct details to open-ended prompts

Model and predictor	$R^2$	Standardized $\beta$ s		
		Model 1	Model 2	Model 3
Model 1	.11*			
PPVT scores		.25*	.23*	.26*
Social support		-.20	-.17	-.16
Model 2	.06			
Cohesiveness		---	.13	-.17
Avoidant attachment		---	-.16	-.13
Anxious attachment		---	-.10	-.10
Model 3	.03			
Social support x avoidant attachment		---	---	-.08
Social support x anxious attachment		---	---	-.15

Note. Model summary at Model 1:  $F(2, 71) = 4.26, p = .02$ , adjusted  $R^2 = .08$ . Model 2:  $F$  change (5, 68) = 2.64,  $p = .03$ , adjusted  $R^2 = .10$ . Model summary at Model 3:  $F$  change (7, 66) = 2.22,  $p = .04$ , adjusted  $R^2 = .11$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

**Table 3**

Regression results predicting children's proportion of correct responses to close-ended questions

Model and predictor	$R^2$	Standardized $\beta$ s		
		Model 1	Model 2	Model 3
Model 1	.12*			
PPVT scores		.34*	.33*	.31*
Social support		.07	.08	.10
Model 2	.01			
Cohesiveness		---	.05	.04
Avoidant attachment		---	-.02	.01
Anxious attachment		---	-.08	-.14
Model 3	.12*			
Social support x avoidant attachment		---	---	.29*
Social support x anxious attachment		---	---	-.25*

Note. Model summary at Model 1:  $F(2, 72) = 4.80, p = .01$ , adjusted  $R^2 = .09$ . Model 2:  $F$ change (5, 70) = 2.02,  $p = .09$ , adjusted  $R^2 = .06$ . Model summary at Model 3:  $F$ change (7, 68) = 3.23,  $p < .01$ , adjusted  $R^2 = .17$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

**Table 4**

Regression results predicting children's proportion of commission errors to close-ended questions

Model and predictor	$R^2$	Standardized $\beta$ s		
		Model 1	Model 2	Model 3
Model 1	.05			
PPVT scores		-.20	-.21	-.16
Social support		-.10	-.09	-.10
Model 2	.05			
Cohesiveness		---	.02	.08
Avoidant attachment		---	.13	.13
Anxious attachment		---	-.20	-.14
Model 3	.14**			
Social support x avoidant attachment		---	---	-.39**
Social support x anxious attachment		---	---	.05

Note. Model summary at Model 1:  $F(2, 73) = 1.75, p = .18$ , adjusted  $R^2 = .02$ . Model 2:  $F$  change (5, 70) = 1.41,  $p = .23$ , adjusted  $R^2 = .03$ . Model summary at Model 3:  $F$  change (7, 68) = 2.96,  $p < .01$ , adjusted  $R^2 = .16$ .

\*  $p < .05$ .

\*\*  $p < .01$ .

**Table 5**

Regression results predicting children's proportion of omission errors to close-ended questions

Model and predictor	$R^2$	Standardized $\beta$ s		
		Model 1	Model 2	Model 3
Model 1	.11*			
PPVT scores		-.33**	-.33**	-.32**
Social support		-.03	-.08	-.02
Model 2	.02			
Cohesiveness		---	.07	.07
Avoidant attachment		---	-.11	-.12
Anxious attachment		---	-.03	-.02
Model 3	.01			
Social support x avoidant attachment		---	---	-.10
Social support x anxious attachment		---	---	.08

Note. Model summary at Model 1:  $F(2, 73) = 432, p = .02$ , adjusted  $R^2 = .08$ . Model 2:  $F$ change (5, 70) = 2.01,  $p = .09$ , adjusted  $R^2 = .06$ . Model summary at Model 3:  $F$ change (7, 68) = 1.56,  $p = .16$ , adjusted  $R^2 = .05$ .

\*  
 $p < .05$ .

\*\*  
 $p < .01$ .