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# Talking after school: Parents' conversational styles and children's memory for a science lesson

Michelle D. Leichtman [a,*], Kaitlin A. Camilleri [a], David B. Pillemer [a], Carmela C. Amato-Wierda [b], Jennifer E. Hogan [a], Melissa D. Dongo [a]

[a] Department of Psychology, University of New Hampshire, Durham, NH 03824, USA
[b] Department of Materials Science, University of New Hampshire, Durham, NH 03824, USA

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ABSTRACT

A scientist taught 40 4- to 6-year-old children an interactive science lesson at school. The same day, children talked about the lesson at home with a parent who was naive to the details of what had transpired at school. Six days later, a researcher interviewed children about objects, activities, and concepts that were part of the lesson. Aspects of parents' conversational style (e.g., open-ended memory questions, descriptive language) predicted how much information children provided in talking with them, which in turn predicted children's memory performance 6 days later. The findings suggest that elaborative parent–child conversations at home could boost children's retention of academic information acquired at school even when parents have no specific knowledge of what children have experienced there.



## Introduction

Educators and researchers are interested in the question of how we might support young children's scientific learning (e.g., Grammer, Coffman, & Ornstein, 2013; Piasta, Logan, Pelatti, Capps, & Petrill, 2015). Research suggests that when science is presented in an engaging and age-appropriate manner, even preschool children can understand basic concepts and participate actively in the learning process (Koerber, Sodian, Thoermer, & Nett, 2005; Piasta et al., 2015). Early science learning promotes the

* Corresponding author.
*E-mail address:* michelle.leichtman@unh.edu (M.D. Leichtman).

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development of abstract thinking and language development and offers children the opportunity to integrate their own experiences with scientific evidence (French, 2004). Yet, many young children have minimal exposure to science during preschool; teachers of young children are frequently uncertain about including science in their curriculum and rarely introduce elementary scientific concepts (Conezio & French, 2002). This lack of early exposure to science may contribute to the gap in scientific knowledge that researchers have identified among elementary, high school, and college students in the United States (Piasta et al., 2015; Sheehy, 2012).

One approach to supporting young children's science learning has been to design and implement interventions targeting teacher behaviors (Grammer et al., 2013; Piasta et al., 2015). The current study focused on a different but complementary influence on children's science education—parents. The study examined how parents talked with their children after school about a classroom science demonstration and tested children's memory for factual and conceptual information in a follow-up interview. To our knowledge, no previous studies have examined the relation between parent–child conversational styles and children's retention of scientific information presented in a classroom setting where the parent was absent. The study builds on two areas of previous research: (a) studies targeting parent–child talk during science activities in museum settings and (b) studies targeting parent–child talk about personal events that the child had experienced previously. Below, we briefly review previous work on these topics and then present the rationale and design for the current study.

### *Parent–child talk about science museum exhibits*

Research on how parent–child interactions influence children's science learning has often taken place in museum settings (Callanan, 2012). Observational studies have suggested that visiting museum exhibits alongside a parent helps children in many ways; for example, parents often foster children's exploration, draw analogies, and engage children in explanatory conversation that benefits their understanding of science-related concepts (Crowley et al., 2001; Tare, French, Frazier, Diamond, & Evans, 2011; Valle & Callanan, 2006). Tessler and Nelson's (1994) findings underscore the dramatic impact that variations in parent–child conversation may have. One week after visiting a museum with their mothers, preschool children remembered only those exhibits that they had discussed with their mothers while walking through the museum.

Using experimental paradigms, researchers have also manipulated parent–child interactions during museum visits. In particular, studies have effectively increased parents' use of elaborative questioning strategies with their young children, resulting in positive outcomes for children's engagement and learning (Jant, Haden, Uttal, & Babcock, 2014; Vandermaas-Peeler, Massey, & Kendall, 2016). In this tradition, Benjamin, Haden, and Wilkerson (2010) encouraged some parents to ask elaborative "wh" questions when engaging with children in a science exhibit about building. They assessed dyads' conversational behavior while visiting the exhibit and children's memory immediately afterward in an interview with an adult who had not been present. Instructions to parents to ask elaborative questions were effective and benefitted children (in combination with building instructions) in recalling the exhibit immediately afterward and in parent–child conversations 2 weeks later. Haden and colleagues (2014) employed a similar manipulation and focused on behavior during a building exhibit with a diverse population of parents. Across ethnic groups, the researchers effectively increased parents' use of elaborative questions.

### *Parent–child talk about personal past events*

Whereas museum studies have focused on parent–child talk about exhibits, autobiographical memory research has focused instead on parent–child talk about personal experiences in the child's life more broadly. Researchers have explored the effects of parent–child conversations that take place before, during, and after children's personal experiences (e.g., Haden, Ornstein, Eckerman, & Didow, 2001; Reese & Brown, 2000; Salmon, Mewton, Pipe, & McDonald, 2011). Most relevant to the current study, research has shown that conversations with parents about past events teach young children how to organize and structure information in memory (Fivush, Reese, & Haden, 2006). These conversations influence children's own recall style such that children's style of talking and thinking about