

Program of Research
XXX

Broadly, my research interests focus on cognitive development in the early childhood years. Specifically, I am interested in assessing the ways in which children's cognition and learning are shaped by exogenous factors, such as those involved in social-communicative exchanges, and individual child-level characteristics. Over the course of my graduate and postdoctoral training, I have been afforded the opportunity to work on four large-scale longitudinal projects that have investigated children's growth and cognitive development in both the home and classroom. These dynamic and intensive studies have honed my skills for developmental inquiry and have provided me with the fundamental skills necessary to become an independent researcher. In addition to these primary research experiences on longitudinal projects, I have also developed a few key experimental studies that serve to elucidate causal mechanisms underlying the generally observed links between social exchanges and children's developing cognitive skills. To illustrate both my experience and commitment to multi-method approaches to research, I highlight my involvement in a selection of the aforementioned longitudinal studies and two complementary experimental projects, as they reflect my work in the home, laboratory, and classroom.

Naturalistic Parent-Child Interaction

The *Developmental Pathways to Skilled Remembering Project* - under the direction of Dr. Catherine Haden (Loyola University Chicago) and Dr. Peter Ornstein (University of North Carolina at Chapel Hill) - sought to track developmental changes in children's memory-related skills across a variety of tasks, beginning when children were 18-months and concluding when they were 72-months of age. Given the goals of the project, a variety of assessments were made in participants' homes at multiple time points, including standardized assessments of language, nonverbal memory tasks such as elicited imitation techniques, event memory tasks including joint activities and mother-child reminiscing, story construction and storybook reading tasks, deliberate and metamemory tasks, and much more. With this project, I was able to amass experience with data sets pertaining to the mother-child reminiscing task, where dyads engage in conversations about previously experienced events, in addition to a joint activity task, in which mothers and children take part in a specially-constructed event and children's remembering is assessed after multiple delays. Thus, I have been able to work with data that seeks to answer questions about the particular factors at the time of encoding information, as well as during retrieval, that impact children's ability to report memory information. For my thesis work, I was particularly interested in understanding how children's language skills, as well as the content of the conversations that occurred while the event was unfolding, contributed to children's recall of the event. Findings from this study indicated that not only were children's language skills and their verbal contributions to the event predictive of their memory scores, but that maternal comments and questions that provided or requested *new* information during the event were also significant predictors of the information children recalled (Ornstein, Haden, & Hedrick, 2004). In addition, we are now isolating specific patterns of conversational exchanges during the event, such as children's correct responses to maternal open-ended questions, that appear to be particularly relevant to children's ability to retain specific event information after delay intervals of up to six months (Hedrick, San Souci, Haden, & Ornstein, 2007; Hedrick, San Souci, Alexander, Coffman, Haden, & Ornstein, 2007). This research ultimately led to the development of my dissertation, which involved utilizing more rigorous experimental methods to support these correlational links between children's engagement in social exchanges and remembering.

Experimental Research: Experimenter-Child Interaction

My dissertation study examined the ways in which preschool-age children's memory for a novel event was shaped by the verbal dialogue they shared with trained experimenters. The focus was on the important use of what we call *elaborative* conversational techniques – tools that have been found to foster children's understanding of an experience, as it is both ongoing and during attempts to remember such experiences. These techniques include asking *wh-questions* to focus children's attention to important aspects of the event, making *associations* between children's previous experiences and prior knowledge to the current event, and providing *positive feedback* in response to children's verbal contributions during the event *and* when engaged in conversations about the event after it has occurred. Indeed, the use of these tools has been found to positively enhance children's ability to recall specific events and researchers have demonstrated that

training mothers to integrate these techniques into their own conversational style is an effective method for increasing children's understanding of particular events.

Given the wealth of correlational evidence available and the promising findings from the most recent experimental studies involving the role of elaborative language exposure, the need for the employment of clearly focused and well-designed experimental methods to further clarify the potential for *causal* relations between language exposure and memory development has become quite clear. My work sought to fill this need by experimentally manipulating children's exposure to elaborative language both during and after experiencing a novel event (Hedrick, 2007). The study involved three time-points for each child, the first of which included engaging in a novel "camping adventure" with an experimenter, followed one day later by a "memory conversation" in which they were asked to recall the camping event with another researcher. The camping adventure is a jointly experienced and interactive event, complete with a variety of features (e.g., plastic food, toy fishing rod and fish, toy barbecue grill) and structured to incorporate three distinct components of camping – packing up, fishing, and cooking out. Children were encouraged to interact with the features of the event and the researcher in their typical manner and their verbal contributions to the event were not limited in any way in order to allow for a truly naturalistic engagement in the activity. However, children's exposure to the language they heard from the researcher both during the event, as well as the first opportunity for remembering in the memory conversation, was manipulated by training the researchers to adhere to an elaborative or "empty" conversational script. Thus, children were randomly assigned to one of four conditions: (1) elaborative language during and after, (2) elaborative language during and empty language after, (3) empty language during and elaborative language after, or (4) empty language during and after. Finally, after a delay of three weeks, all children participated in a structured memory interview to elicit their comprehensive recall of all aspects of the event.

As anticipated, findings reveal a dramatically large main effect of the after talk condition, such that children who engaged in a memory conversation with a researcher who asked *wh-questions* about the camping trip, made *associations* between what the child experienced while camping and common knowledge, and *positively evaluated* the child's provision of memory information were able to recall many more feature labels and, perhaps more importantly, were remembering abundantly more specific details about the event. These findings are consistent with previous literature, supporting the hypothesis that the use of elaborative language techniques when eliciting children's memory for events can be quite influential in boosting children's recall. Yet certainly, given the experimental design, children's recall during the standardized memory interview after the three-week delay is of particular interest. Results indicate that children who engaged in elaborative conversations *during* and *after* the event evidenced the highest recall of both features and embellished details about the event. To be sure, findings suggest that the impact of elaborative conversational engagement may very well be additive over time, such that children who participate in multiple elaborative exchanges about an experience are able to create detailed memory representations from which they can then draw during opportunities to remember the event. Future research is necessary to determine the influence of such conversations over time, and I plan to make use of this experimental paradigm to investigate further questions related to length of interview delay, language ability of the child, and consistency in conversational partner.

Experimental Research: Parent-Child Interaction

I have recently launched another project that represents my continued commitment to experimental methods and is yet another extension of the ways in which we can explore the role of conversational engagement during novel events. This project focuses on maternal training and goal orientation while interacting with their children in a unique "farm to market" adventure. Mothers of 4-year-old children are being recruited and randomly assigned to one of four experimental conditions: (1) trained explicitly in elaborative conversational techniques, (2) instructed that the goal of the activity is to have their child *understand* the event, (3) instructed that the goal of the activity is to have their child *remember* the event, or (4) a control group instructed to interact with their child as they typically would. Children's memory for the unique experience will then be assessed after delays of 1-day and 3-weeks and we expect that children of trained mothers and children of mothers who are given explicit goals for the activity will evidence quite different patterns of recall than children of control mothers. We are also collecting information on maternal reminiscing style and children's independent deliberate memory skills. This project is ongoing and we anticipate intriguing information about the effects of maternal

goal orientation on their linguistic approach to a jointly experienced task and children's subsequent retention of information.

The Family and Classroom Contexts

In addition to my current experimental work, I am also involved in a large-scale collaborative longitudinal project with Dr. Martha Cox, Dr. J. Steven Reznick, and Dr. Peter Ornstein at the Center for Developmental Science at UNC-Chapel Hill. *The Durham Child Health and Development Study (DCHDS)* has tracked a sample of children and their families from infancy through the pre-school years. The sample was selected to reflect both racial and socio-economic diversity, and as such, will allow for a unique set of analyses to tease apart these often confounded variables. Comprehensive assessments were made every six-months and much detailed information has been collected about the children, families, and communities in which they are embedded. A continuation of this project has recently commenced, in which children are followed through the early elementary years, and this rich dataset should afford interesting insight into children's development across a variety of domains (e.g., social-emotional and cognitive) within a diverse sample. Given my interests, I am examining maternal and child interaction during several tasks to determine how social-communicative exchanges shape children's memory and academic knowledge. Specifically, I am currently working with data from a mother-child reminiscing task in which mothers and children talk about previously experienced events, as well as a book-reading task in which mothers and children read a novel storybook together. Data coding and analysis for this project is ongoing, but I plan to be able to examine how such verbal interaction – as demonstrated in these tasks - links to children's developing cognitive skills over time, as they transition to school.

As the DCHDS project continues, we will target specific clusters of children to follow into the classroom for detailed observations. We propose to code for various factors in the classroom – including teacher language – to determine how children with varying home and preschool experiences may differentially benefit from the linguistic milieu of the classroom. Another line of research I am involved with relates directly to the classroom setting and I have spent many hours carrying out detailed observations of the elementary classroom context. This research within the classroom has revealed that first and second-grade children of teachers who are classified as using “high mnemonic” language – that which references cognitive structuring and requests for memory information – exhibit increased growth in a variety of deliberate memory and academic tasks (Coffman, Ornstein, Grammer, Hedrick, Lee, & Price, 2007). Thus, with a series of focused classroom observations, in conjunction with the wealth of information we have on participating children and families, we will be able to determine the ways in which the early home environment interacts with the early school environment to produce changes in children's cognitive skill.

Summary

On the whole, my interests focus on exploring the ways in which conversational partners and the verbal experiences children have with adults influence their memory and subsequent knowledge. I have been able to work on a variety of projects and utilize various multi-method approaches to examine the multiple child-level, family-level, and school-level factors that impact children's developing cognitive skill. I plan to continue my endeavors at isolating the underlying factors that mediate change in children's capabilities and I am currently conducting several projects. Indeed, on a more applied level, I am quite interested in how the way we have recently been able to illuminate the causal links between the role of language and children's learning and memory lends itself to exploring the applicability of such understanding. To be sure, the ease with which previous training and experimental studies have proven effective could be taken as a sign that further expanding this conversational training method into more applied settings, such as parenting classes, preschool programs, and more formal educational situations could yield potentially remarkable benefits. This application is something in which I am particularly interested. The relative simplicity of a well-crafted elaborative conversational technique training program, in conjunction with a population that could substantially benefit from an increased understanding of personally-relevant or academically-enriched experiences, could hold much promise. Of course, much more basic work is needed in order to determine the efficacy of such training programs across diverse populations, as well as the longevity of the training effects, before continuing on with the development of such educational programs. However, the future application of this work is promising and I am committed to developing and carrying out a research program that seeks to answer these basic empirical questions and work towards these applied goals.