

## 1 Questions about Questions

### Framing the Key Issues

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How do children make sense of the world around them? One theoretical approach emphasizes how children actively construct an evolving understanding of the world as they interact with it in the course of everyday life. Like “little scientists,” children independently track patterns and regularities in their environment, make inferences on the basis of those patterns, and test out and revise hypotheses as they accumulate relevant evidence. Another theoretical approach emphasizes how children learn by paying attention to others, as well as from direct instruction. This approach emphasizes children’s dependence on information they receive from other people. Despite the complementary nature of these two approaches, research steeped in each tradition often operates independently from the other. Some research has focused on how children acquire information through first-hand observation and experimentation (e.g., Carey & Gelman, 1991; Gopnik & Schulz, 2007; Weisberg et al., 2015). Other research has focused on children’s sensitivity to the types of individuals who are good sources of information (see Harris, 2012; Harris et al., 2018). In both learning approaches, children’s use of questions is critical: Questions complement children’s independent first-hand investigations of the world, and questions redirect instruction and modify the input they receive from individuals. Further, questioning may provide a conduit for the socialization of information-seeking. That is, the ways in which peers, parents, and educators ask and answer questions may play a critical role in shaping children’s approach to searching for and making use of information as they go about constructing a conceptual understanding of the world. These two complementary uses of questioning, as well as the potential ways in which they are socialized and shaped by the environment, highlight the importance of understanding the role of questioning in learning and development, both for researchers aiming to generate a broad understanding of how children develop as well as for parents and educators who accompany children in that development. And yet, relative

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to other aspects of children's inquiry, research on children's questions has been relatively sparse.

Research on question-asking behaviors has been conducted across a number of disciplines, most notably in psychology and education. Research in psychology has focused on the role of domain-general cognitive abilities and on the role of prior knowledge as constraints on children's question-asking behaviors, and has gathered information about the development of question-asking from infancy to elementary school. Research in education has examined how the ability to formulate questions and use them to guide inquiry can be taught to students, as well as how the development of this skill impacts various aspects of students' learning, from reading comprehension to their ability to engage in scientific inquiry. However, despite obvious synergies between these different approaches to investigating questioning in learning and development, rarely has research across these disciplines been brought together. This diversity of perspectives makes this volume unique insofar as many of these researchers might not otherwise appear alongside one another. Our goal in editing this volume was to bring together an interdisciplinary and international group of experts in psychology and education, representing a variety of distinct methodological and theoretical backgrounds. The inclusion of diverse perspectives allows for a broader synthesis than would otherwise be possible, and results in a volume wherein researchers and educators from diverse backgrounds can gain new knowledge and develop a fuller, interdisciplinary understanding of how questions play a pivotal role in child development and education. Ultimately, this volume synthesizes the current knowledge on the role of question-asking in cognitive development and learning, with the hope that it will stimulate interdisciplinary dialogue, galvanize interest, and stimulate collaboration and further research on the topic of questioning in development.

Taken together, the chapters in this volume answer three broad questions. First, **where do questions come from, and how do children engage in questioning across development?** There are several key issues here. One encompasses when and how questions begin in development, including whether they are initially rooted in affective or noncognitive attitudes or whether they are metacognitive from the outset, and what the relation is between nonverbal gestures and later verbal questions. Further issues include how questioning changes as children develop both in their social cognitive capacities and their conceptual representations, as well as how questioning relates to, facilitates, and is shaped by a developing understanding of evidence and inquiry.

Second, **to what extent is a questioning stance universal, and in what ways is this stance socialized?** Essentially, our key overarching concern here is how environment and culture influence the development of questioning. This includes issues such as how the nature and mode of questioning may vary across contexts and cultures, how different experiences with the ways in which adults both pose and respond to questions may shape the child's own process of inquiry, and how different educational environments may foster the growth of questions. This also includes important issues surrounding how we view practices in non-Western cultures, and on how this should inform our understanding of what constitutes questioning and inquiry in different cultures.

Third, **what role does questioning play in learning more broadly, in both formal and informal learning environments?** Here, our key goal is to map out the ways in which questioning can impact learning. This includes exploring how questions both from and to the child can facilitate an ongoing, interactive exchange of information, how this can foster learning in a variety of ways, and how educational environments and practices can best facilitate questioning and inquiry.

In addressing these questions, the volume is divided into three primary sections. The first section provides an overview of several theoretical approaches to thinking about and researching questioning, its development, and its effects on learning. **Carruthers** (Chapter 2) presents a theoretical account of how questioning might “get off the ground” early in development, through what he describes as nonverbal questioning attitudes, or a general questioning stance. **Harris** (Chapter 3), meanwhile, focuses on the importance of metacognition in questioning. How is it that children come to be aware of their own uncertainty, how do they express that uncertainty, and how does that affect their inquiry and learning? **Wellman** (Chapter 4) proposes that questioning is driven by two complementary drives: to understand and to learn. He then reviews the evidence that, from very early in development, questioning is driven by and towards both goals. Finally, **Callanan, Solis, Castañeda, and Jipson** (Chapter 5) discuss cross-cultural differences in questioning in development, focusing on how best to frame, investigate, and interpret evidence for these differences.

The second section chronicles the development of question-asking in childhood as well as how this development is influenced by children's cognitive development. Children's questioning behavior has been seen as an important source through which they interact with social others to gather information. The authors of this section highlight the various nonverbal and verbal strategies associated with children's information-seeking behavior, as well as individual differences in children's behavior

based on cognitive, social, and environmental factors. Specifically, the first few chapters in this section explore the development of children's information-seeking behavior. **Lucca** (Chapter 6) outlines how a questioning stance develops and is present in children's nonverbal pointing prior to the child's first expressive language. **Jones, Swaboda, and Ruggeri** (Chapter 7), and **Mills and Sands** (Chapter 8), highlight how verbal questioning develops through early childhood and elementary school as a strategy to constrain the possible conclusions drawn from evidence. **Neale, Morano, Verdine, Golinkoff, and Hirsh-Pasek** (Chapter 9) demonstrate that not only are children's questions useful for constraining inferences, but they also highlight the limits of children's understanding of a particular categorical boundary – in their case, understanding of shape. Finally, **Gauvain and Munroe** (Chapter 10) describe children's question-asking behavior (and lack of questioning) across four diverse societies, highlighting the need for considering questions as one of multiple possible strategies children use to gain information about the world.

The third section explores how questions posed *to* children influence their inquiry, learning, and reasoning. This section also draws explicit connections to classroom and educational practice. **Zambrana, Hermansen, and Rowe** (Chapter 11) explore how mothers' use of questions impacts both children's learning and their language development, presenting both an in-depth review of the literature addressing this issue, as well as showcasing a new study building on this prior work. **Kuhn, Modrek, and Sandoval** (Chapter 12) focus on the importance of questioning later in childhood, emphasizing the continued relevance of questioning throughout children's formal education, and discussing ways in which educational environments can foster questioning, inquiry, and argument. **Walker and Nyhout** (Chapter 13) discuss how “wh-questions” directed to children shape their reasoning and identify benefits and pitfalls of three question prompts: requests for explanations (why?), requests for additional explanations (why else?), and counterfactuals (what if?). **Osborne and Reigh** (Chapter 14) explore what makes a good question, presenting a novel epistemic framework for classifying questions, and discussing how this framework could be put to use in the classroom in order to facilitate high-quality questioning.

Finally, in a closing chapter (Chapter 15), we return to the key questions posed above. For each question, we synthesize the ways in which the contributed chapters address it, as well as considering new and important concerns that have arisen over the course of the volume. We conclude by charting a path forward for the field as a whole, laying out an agenda for the coming years of research along several dimensions. The current state of the field as laid out in this volume presents exciting opportunities for

deepening our understanding of the role of questioning in development. But it also presents a number of theoretical, methodological, and practical challenges that researchers will need to grapple with. We hope that the path we pose for the future of investigations into the questioning child will guide scientists working in this important area of research, and help generate potential tools for addressing important societal issues in the coming years.

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