There is a very useful two-page research agenda at the end of chapter 1 by Zuckerman. But it is not integrated with the rest of the book. For the book to move us forward with respect to a research agenda, it would require inclusion of the latest thinking on many of these issues, a dialogue among the authors, and a concluding chapter detailing and integrating unresolved puzzles they raise.

I was particularly disappointed that there is only minimal discussion by the editors of the interview material. (Nor is there any indication of how these particular interviewees were chosen, why the interviews were included in a book of papers from a series of conferences, or when the interviews were conducted, a salient concern in fields that change rapidly.) I wish that some of the more theoretical papers in the volume had integrated material from the interviews. Such an integration would have contributed greatly to the book's goal of developing a research agenda in this field.

MYRA H. STROBER
School of Education, Stanford University, Stanford, CA 94305

What Children Know

Knowing Children. Experiments in Conversation and Cognition. MICHAEL SIEGAL. Erlbaum, Hillsdale, NJ, 1991. x, 154 pp., illus. $32.50.

"Anyone who knows children realizes that they have an understanding which often is not reflected in what they say and do." So begins the preface of *Knowing Children*, which makes two major points, both implied in its title: first, that much past and current research underestimates young children's abstract knowledge, and second, that it is important to discover the extent of young children's implicit knowledge because of possible implications for the teaching of academic skills.

The author blames researchers' reliance on inappropriate questioning techniques for findings that portray children's knowledge of the physical and social world as curiously simplistic. Specifically, he claims that these questioning techniques ignore differences in adults' and children's understanding of conversational rules, such that children may perceive adults' well-meaning questions to be ambiguous, irrelevant, pointless, insincere, or uninformative. Others, such as Donaldson (*Children's Minds*, Norton, 1979), have raised these points in the past, though they have not laid them out in as much detail as Siegal. Few, however, have asked what these new findings mean in terms of parental teaching and early childhood education.

In reviewing the literature on infant cognition, which cannot rely on language, Siegal highlights researchers' ingenuity in the use of nonverbal methods to uncover the rudiments of infants' abstract knowledge. He argues that similar ingenuity should be exercised when probing preschoolers' knowledge of implicit abstract concepts. Siegal thus takes a different position from Piaget, who attributed qualitatively different logical thought structures to children of different stages of development. In the rest of the book he reviews recent and classical Piagetian-inspired studies of just what children understand about such topics as number and measurement, classification, time, and causality. Siegal is adamant that repetitive questioning, especially the use of "trick" questions, may lead young children to give nonsensical answers ("Why would he ask me again? He must want me to change my mind."). Misunderstandings or boredom may similarly result in confabulated answers just to get the task over with.

What is the evidence supporting Siegal's claims? Citing his own and other researchers' attempts to uncover earlier forms of preschoolers' understandings of the physical and social world, he shows that findings change when questions change. For example, the accuracy of answers increases when young children are asked fewer questions per session, when the domain of study is about a content area meaningful to them (such as food), or when they do not have to formulate an answer themselves but are instead given an opportunity to choose between two hypothetical possibilities.

Siegal thus contends that, when studied in supportive contexts, young children's mastery of abstract concepts seems to be gradual rather than sudden. Therefore, he suggests, it is counterproductive for parents and educators to take a passive stance towards young children's capacity to learn. We should no longer match demands to children's supposed level of readiness. Rather, materials should be prepared in such a way as to pull children from current levels toward higher levels of understanding. In line with this argument, Siegal believes that parental involvement in *informal* instruction could play a key role in encouraging young children's mastery of the rudiments of number and literacy concepts, including, for example, an understanding of fractions. He is not calling for formal schooling for four-year-olds, but he finds the attitude that "it is better for a child to find and invent his own solutions rather than being taught" much too complacent. This attitude implies that there is little for teachers and parents to do except to await certain developments.

One curious omission in Siegal's essay is his failure to integrate Vygotskyan-inspired research into his thesis. According to Vygotsky all higher mental functions initially come into being through children's social interaction with more knowledgeable adults. In this view, adults are not the passive bystanders described by Piaget but are active guides who supportively induct children into culturally valued knowledge. Because Siegal, apart from one brief citation, ignores Vygotsky and Vygotskian-inspired research, the second part of his thesis, that children's implicit knowledge has important implications for the teaching of academic skills, seems much less developed than the first. Nevertheless, it is to his great credit that he focuses on the practical implications of new findings on children's understanding of physical and psychological causality, including their understanding of the distinction between reality and appearance and of spatial and social perspective-taking. Let us hope that this book will be read by early childhood educators, with a view to challenging traditional ideas on curriculum development.

INGE BRETHERTON
Department of Child and Family Studies, University of Wisconsin, Madison, WI 53706