

Reflecting on Representation and Process: Children's Understanding of Cognition

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I. INTRODUCTION

Questions about the nature of representations, the structure of knowledge, and the relationship among perceptual and cognitive processes figure prominently in cognitive theories. These same issues play a central role in the child's evolving understanding of the cognitive system. In this chapter, we will explore preschoolers' and young elementary school children's conceptions of representations and the distinctions they make among various perceptual and cognitive processes. As we review these topics, it will become clear that even three-year-olds are aware of the unique status of mental representations. Young children recognize that they can manipulate representational entities, such as images, simply through mental effort and concentration, but that mental powers are not sufficient for altering physical objects. However, three-year-olds are less clear about the relationship between process and representation. They seem to recognize that some representations are the products of mental processes, such as pretending and imagining, but they find it difficult to reflect on the relationship between supposedly veridical processes, such as perception, and the representations they produce. This latter insight seems to depend on an understanding that perceptual and cognitive processes actively construct and transform information to produce knowledge, and as we will see, young preschoolers do not really appreciate this constructivist aspect of the mind.

An important part of understanding how the mind works involves understanding the distinctions and interrelations that exist among various perceptual and cognitive processes. In this review, we will explore the extent to which children distinguish among these processes and whether children's metacognitive knowledge is organized around these distinctions. As we examine children's conceptions of mental activities, it will become clear that even preschoolers understand that each perceptual system can function independently and that they have at least a rudimentary understanding that perceptual acts can be distinguished from more cognitive activities. Young elementary school children also make some distinctions among cognitive processes and we will consider what these distinctions reveal about how children organize their knowledge about the mind.

A. Chapter Overview

In recent years, developmental psychologists interested in children's ability to reason about intentional behavior and intervening mental processes have posited that even preschoolers possess a "theory of mind." Theories are also

thought to guide conceptual development in other areas. For example, preschoolers have been credited with biological theories and theories about the physical world (see, e.g., Carey, 1985; Keil, 1989). Obviously, this approach to cognitive development raises a number of very important questions. Perhaps the most central of these is what it means to say that knowledge is structured around a theory. In the opening section of the paper, we will explore in some detail the "theory approach" to cognitive development and we will consider why psychologists such as Wellman (1990) believe that it is appropriate to credit young children with a theory of mind.

Two- and three-year-olds' speech is peppered with references to the mental world, and this has sometimes been cited as evidence that the young child possesses a theory of mind. In the second section of this paper, we will examine the mental lexicon to see whether natural language might provide some insight into the child's growing awareness of the mental world. Research on children's use of mental verbs suggests that four-year-olds appreciate that these terms have distinctly mental referents, even though these children do not appropriately discriminate among the mental verbs. As we explain in this section, these findings might suggest that preschoolers find it difficult to distinguish among more central cognitive processes.

Preschoolers could, of course, fail to discriminate among mental verbs even though they understand the distinctions and interrelations that exist among perceptual and cognitive processes. In the third section, we will review some recent studies that focus on whether children distinguish among perceptual processes and how children conceive of the relationship between seeing and knowing. One topic that figures prominently in these discussions concerns the child's conception of representation. We will consider whether young children distinguish between percepts and knowledge-based representations as well as their ability to deal with contradictory representations. This work will be framed in terms of a proposed shift in the child's evolving theory of mind in which a passive copy theory of knowledge gives way to a more active constructivist view (see, e.g., Chandler & Boyes, 1982; Wellman, 1990).

Traditionally, studies of metacognitive knowledge have focused on children's understanding of task and situational factors that affect performance. These studies are important because if children are able to distinguish between relevant and irrelevant situational variables in the context of simple cognitive activities, it would suggest that they are able to reflect on the cognitive processes that are used to accomplish these tasks. In the fourth section, we will review a

