

CHILDREN'S THEORIES OF MIND

**Mental States and
Social Understanding**

Edited by
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Children's Theories of Mind: Mental States and Social Understanding

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Preface

Recent work on children's theories of mind has refreshed the study of the mental life of the child. The new research acknowledges the child's conceptions of intention and belief, as well intention and belief themselves, and considers the explanations they provide for the developing abilities of the child. Effects of the child's theory of mind spread across cognitive, language, and social development. The topic, therefore, holds the promise of bringing a unifying influence to developmental psychology. This book on the child's theory of mind began its life as a study group that met for several days in March, 1988 at Yale University. Sponsorship by the Society for Research in Child Development and the Foundation for Child Development was critical to the success of the project. It allowed the group to be international in composition; a necessity when laboratories in Canada, the United States, England, and Europe are all engaged in the research. It also permitted us to meet and talk before committing our thoughts irretrievably to paper. This procedure, we believe, was responsible for the new speculations on the acquisition of theories of mind that made their way into the contributions between the first discussions and the final drafts. We thank Judi Amsel and Debra Ruel at Lawrence Erlbaum Associates for their excellent supervision of the published result.

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CHAPTER 1

The Acquisition and Utility of Theories of Mind

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Imagine that the following story is acted out for a child: A boy comes home, places some chocolate in a cupboard, and then leaves the room. While he is gone, his mother comes in and happens to move the chocolate to another cupboard. Later, the boy returns and wants to eat the chocolate. Where will the boy look?

Notice that a correct answer to this question depends on the child knowing something about the beliefs of the boy in the story. In other words, it depends on the child having a “theory of mind” (Astington, Harris, & Olson, 1988), that is, an understanding that people have mental states including thoughts, beliefs, and desires.¹ In this instance, the child must realize that the boy’s beliefs do not match reality. Wimmer and Perner (1983), who devised the false belief paradigm, found that younger children say that the boy will open the cupboard

¹The terms *folk psychology* or *commonsense psychology* may more adequately capture what is being developed during the preschool years. The child is not really developing a theory in anything like its scientific sense (Johnson, 1988) but rather a way of thinking and talking about self and others that involves mental states. Unfortunately, however, these phrases have acquired somewhat pejorative connotations through their adoption by instrumental and reductionist philosophers of mind (e.g., Churchland, 1984; Stich, 1983), who have claimed that such psychology is, at best, an inadequate way of understanding mental states, that its constructs have no ontological reality, and that it will ultimately be replaced by a true neuroscientifically based account. We, therefore, somewhat reluctantly retain the phrase “theory of mind.”

where the chocolate actually is. It is not until 4 or 5 years of age that their results indicate that the boy will look in the original cupboard. Subsequent studies (Baron-Cohen, Leslie, & Frith, 1985; Gopnik & Astington, 1988; Perner, Leekam, & Wimmer, 1987) have confirmed these findings.

There has been a sharp increase over the past several years in the amount of research conducted on what children know about their own and other people's minds. The increase would seem to be justified for two basic and related reasons. A theory of mind makes an enormous difference to the child. As the preceding example illustrates, it transforms the way children are able to see other people and make sense of what they are doing. Of course, it also makes a difference to our understanding of the child. If the results of the false belief task are a guide, then making sense of "the child's theory of mind" will be important for explaining developmental changes in the child's responses to situations where they must consider what other people are actually doing—in other words, almost all social situations.

The contributors to this volume discuss several aspects of the child's theory of mind. They present research that illuminates the young child's theory of mind and how it changes. That research stands well on its own. They also provide discussions of the utility of a theory of mind to the child and to developmental psychologists trying to understand children. Finally, new explanations are offered for how children acquire such a theory in the first place. The question of acquisition is a very difficult one. Because the mental states of others cannot be observed, how does the young child ever come to postulate their existence? Some background to the questions of the utility of the child's theory of mind and how theories of mind may be acquired is sketched in the following section.

THE UTILITY OF A THEORY OF MIND TO THE CHILD

The major ways in which the development of a theory of mind enters the life of the child can be placed in two familiar categories. A theory of mind, is firstly and most obviously, a powerful social tool.² It allows the

²It is worth pointing out that the idea that human intelligence evolved as social intelligence appears to be gaining ground over the possible competitors, namely that intelligence evolved for increasingly sophisticated tool use or foraging (see, e.g., Byrne & Whiten, 1986). Thus, the view that the investigation of the child's theory of mind is central to our understanding of child development is one that fits with recent thinking on hominid evolution.

explanation, prediction, and manipulation of the behavior of others. Secondly, acquiring a theory of mind may well be instrumental in the development of particular forms of reasoning and, as such, may represent a significant step in cognitive development.

Social Function

At its most basic, social behavior can be broken down into cooperation and competition. We either try to work with others to achieve goals of mutual benefit or we try to improve our position at the expense of others. (Often, of course, cooperation and competition become combined, as when we form alliances to compete with others; examples can be found throughout social behavior, from friendships to team sports to war.) The common elements of mental state psychology—belief, desire, and intention—play central roles in competitive and cooperative social behavior. For example, competition requires recognizing when other people's desires conflict with our own so that those desires can be blocked or overcome. One of the first competitive strategies that makes its way into the child's behavioral repertoire is deception, including lying (Chandler, Fritz, & Hala, 1989; Lewis, Stanger, & Sullivan, 1989; Shultz & Cloghesy, 1981; Sodian, *in press*; Wimmer & Perner, 1983). Although deception can occur at a number of different levels (Mitchell, 1986), the more effective variants depend entirely on mental state psychology. The point of lying is to give someone else a false belief, a misrepresentation of reality. Effective lying means telling them something they are likely to believe. Thus, lying well requires knowing that others can have false beliefs and having some idea of which ones they are likely to embrace.

A form of cooperation that is noteworthy, both because it carries such powerful social force and because it provides an intriguing puzzle for theories of social behavior, is altruism. In order to behave altruistically, it is, by definition, necessary to take into account the needs and desires of others. It is probably also important to be able to assess the beliefs that others have about us; for example, knowing that others will think well of us if we act altruistically but poorly if we do not. Certainly, the middle stages of moral reasoning which Kohlberg and his followers (e.g., Colby, Kohlberg, Gibbs, & Lieberman, 1983) have claimed characterize most adolescents and adults seem to be based on the ability for such an assessment.

Lastly, in a social world where both competition and cooperation are possible, the judgment of intention appears to be particularly useful. Ascribing intention to others allows one to look for the goals in the

other's actions (Premack & Woodruff, 1978). In addition, the assessment of other people's intentions provides an index of the valence of their attitudes towards us. For example, if someone performs an action with deleterious consequences for another, then it is to the latter's advantage to know whether that action reflected a negative attitude on the part of the actor and may be repeated, or whether it was essentially a mistake. Dunn (see chapter 6, this volume) presents some examples that may reveal the developmental origins of this process.

Cognitive Function

It is becoming reasonably well established that a theory of mind turns on the ability to represent mental states and processes. Terms such as metacognition and metarepresentation are often used in this context, and it is worth explicating these further. Metacognition usually denotes knowledge about the cognitive system, including, perhaps most obviously, memory. Since the 1960s, it has been known that children's understanding of memory changes with age and that their memory performance appears to be tied to their knowledge of mnemonic strategies. For example, Flavell and his colleagues (e.g., Flavell, 1970; Keeney, Cannizzo, & Flavell, 1967; Moely, Olson, Halwes, & Flavell, 1969) showed that, although young children tended not to employ strategies such as rehearsal on short-term memory tasks and consequently performed poorly, this failure could be construed as a production deficit rather than a mediation deficit. Teaching the children to use memory strategies greatly improved memory performance.

Metarepresentation is a term more commonly employed in the literature on the theory of mind. Two usages of this term need to be differentiated. Firstly, metarepresentation can be taken to mean merely embedding one representation within another. Thus, one can think about a thought that another person has. Conceivably, such embedding can occur to an infinite extent. Secondly, metarepresentation can mean modelling the representational process (Perner, 1988a) so that, for example, one can think about another's belief as false. In the latter case, we are talking about representing a representation as a representation of reality or, in other words, judging how the person's representation relates to the world.

The development of metarepresentation in the second sense results in an important change in the way the child thinks about the world. Acquiring such a theory of mind involves the simultaneous recognition that there is a single reality but that different people, or the same people at different times, may have different representations of that reality. In

other words, the child develops a distinction between subjective and objective (Russell, 1984). Such a distinction is crucial if the child is ever to gain an understanding of the difference between facts and values, in that facts are objective and not open to argument, whereas values and opinions are subjective and may differ between people (Russell, 1982). Similarly, in order to appreciate the notion of "correctness," the child must be able to recognize that there is "only one world against which alternative representations must be assessed" (Forguson & Gopnik, 1988, p. 239). Without standards of truth, it is easy to see why, since Piaget's time (Piaget, 1928), young preschoolers have been described as illogical (Forguson & Gopnik, 1988).

If the arguments of the previous paragraphs are correct, then one might expect that individuals without a theory of mind would suffer severe social and cognitive problems. It is possible that such individuals do exist. A number of studies have shown that autism may well be the result of a specific deficit in the cognitive abilities involved in the construction of a theory of mind (Baron-Cohen, Leslie, & Frith, 1985, 1986; Leslie & Frith, 1988; Perner, Leslie, Frith, & Leekam, 1989). For example, Baron-Cohen, Leslie, and Frith (1986) found that, compared to mental age matched retarded and normal children, autistic children perform particularly badly on tasks that require the subject to impute intentional states to others, while they perform as well as controls on problems that require causal or simple behavioral reasoning.

THE UTILITY OF A THEORY OF MIND TO DEVELOPMENTAL PSYCHOLOGY

Theory of mind is becoming a valuable approach in the study of child development. It furnishes a framework for generating new research and, at the same time, for looking at various traditional issues in developmental psychology. The fertility of the approach is evident in the mass of new empirical work produced in the last few years. However, the issues that are considered in this approach have a history as long as any within developmental psychology, dating back to the earliest work of founders such as Baldwin (see Bretherton, chapter 4, this volume) and Piaget. In order to illustrate these two points, it may be instructive to glance at the history of the "theory of mind" construct.³

The modern beginnings of theory of mind research are easy to find.

³We acknowledge Janet Astington's contribution to our reading of the early history of the theory of mind construct.

A clear starting point is Premack and Woodruff's (1978) article, "Does the chimpanzee have a theory of mind?" published in the *Behavioral and Brain Sciences*. Premack and Woodruff investigated the ability of the chimpanzee to predict what a human would do in certain goal-directed circumstances, and they claimed that the animals exhibited skills that required an understanding of the mental states of the human actor. As shown in the commentaries on the article, the work generated intense interest in what would be required as firm evidence for such an understanding. That interest spread into developmental psychology, where Wimmer and Perner (1983) were the first to begin to test the issue with children, using their false belief paradigm.⁴

It did not take long for a number of correspondences and controversies to appear. Various researchers showed that a number of other developments seem to occur at about the same age as the recognition of false beliefs. The work on understanding false belief was extended to include self-knowledge. Gopnik and Astington (1988; Astington & Gopnik, 1988) showed that at about the same time children develop the understanding that other people may have beliefs that are false, they also start to recognize that they themselves may previously have had beliefs that turned out to be wrong. In addition, the recognition that objects can, in reality, be different from how they appear also shows a similar developmental progression (Flavell, Flavell, & Green, 1983; Gopnik & Astington, 1988; Moore, Pure, & Furrow, 1990). All of these developments seem to rest on the understanding that mental representations may differ from reality (Astington & Gopnik, 1988; Flavell, 1988; Fergusson & Gopnik, 1988).

It soon became recognized, however, that young children do not simply have difficulty with representations that differ from reality. From about 2 years of age, children are quite capable of engaging in pretend play, or, in other words, manipulating representations that differ from the way the world is (Leslie, 1987, 1988). The apparent discrepancy between young children's ability to pretend and their ability to pass experimental tasks such as that of Wimmer and Perner created favorable conditions for further theorizing and experimentation. Perhaps the crucial distinction that came out of this controversy was the distinction drawn most clearly by Perner (1988a), and outlined earlier, between having a representation of a representation, which pretense requires, and having a representation of a representation as a representation, or

⁴It should be noted that Bretherton and her colleagues have priority in terms of introducing the phrase "theory of mind" into the developmental psychology literature (Bretherton, McNew, & Beeghly-Smith, 1981).

a representational theory of mind, which is required in order to recognize the existence of false beliefs.

More recently, others have claimed that false belief may not be the best way of investigating the child's theory of mind. Wellman and his colleagues have shown that even though children younger than 4 years old may not perform successfully on false belief tasks, they do, nevertheless, have considerable knowledge about mental states and processes (Wellman, 1988). For example, 3-year-olds know that mental images of objects are different from real objects (Wellman & Estes, 1986), and they are able to predict other people's behavior on the basis of the other's desires (Wellman & Bartsch, 1988). Naturalistic observations reveal that children appear to be thinking and talking about mental states some time before they are successful in false belief tasks (Bretherton, McNew, & Beeghly-Smith, 1981; Shatz, Wellman, & Silber, 1983). Although such observations are always open to more reductive kinds of explanations (Perner, 1988b), they are at least suggestive of a sensitivity on the part of the young preschooler to the existence of mental life. Chandler and colleagues (Chandler et al., 1989) have criticized the apparently demanding nature of the false belief task and argued instead for deception as the criterion of understanding mental states. They have reported that 2- to 3-year-old children are capable of behaving deceptively in a novel game-playing situation. However, this result contradicts much of the rest of the available evidence on deceptive behavior in children, and, consequently, urgently requires replication for validation (e.g., Shultz & Cloghesy, 1981; Sodian, in press).

Up to this point, we have dealt only with what children know about the nature of belief. Another growing topic has been children's understanding of how information is passed between minds and between world and mind. The study of children's understanding of communicative efficacy has been studied at least since Piaget's early work (Piaget, 1926) and continues to intrigue researchers (e.g., Beal, 1988; Bonitatibus, 1988; Flavell, Speer, Green, & August, 1981; Robinson, 1981). Piaget, of course, claimed that young children were egocentric and therefore unable to communicate effectively. More recent studies have considerably refined Piaget's notions in showing that, even into the early grade school years, children are poor at judging the adequacy of messages either sent or received and that they have no clear distinction between actual message meaning and speaker's intended meaning (Beal, 1987; Beal & Flavell, 1984; Robinson, Goelman, & Olson, 1983).

According to Piaget, another manifestation of the egocentrism of preschool children's thought is an inability to take the perspective of another and a tendency to claim that others see the same view as one's

own (Piaget & Inhelder, 1956). Research on perspective taking has been plentiful since Piaget. Much of it has demonstrated that under different conditions preschool children can take the perspective of another, especially when the children are asked to report what object another can see, as opposed to how the object appears (Masangkay et al., 1974). Flavell and his colleagues (Flavell, 1978; Flavell, Everett, Croft, & Flavell, 1981) developed this notion into a distinction between level I and level II perspective taking, with the transition coming at about 4 years of age. Level I perspective taking entails the ability to recognize that another person can see something different from oneself. Level II perspective taking entails the further ability to recognize how something appears to someone else. Flavell showed that, developmentally, level II perspective taking is correlated with understanding of the appearance-reality distinction (Flavell, Green, & Flavell, 1986). Again, the theory of mind approach has brought greater coherence to the literature. Flavell has recently extended the distinction between level I and II perspective taking to cover other aspects of children's theories of mind, such as the understanding of false belief (Flavell, 1988).

Most recently, a new line of work has emerged on children's understanding of the origins of beliefs. Young preschoolers seem to know that perceptual contact, a direct line of sight, is necessary for something to be seen (Yaniv & Shatz, 1988). It is not until age 4 to 5, however, that children recognize that acquiring a belief will depend on comparable kinds of access to relevant information (e.g., Gopnik & Graf, 1988). Even then, the story is not complete, because it is not until later in development again (age 6 to 8) that children recognize that informational access interacts with an observer's pre-existing knowledge in order to determine current knowledge (Taylor, 1988).

THE PRESENT VOLUME

The chapters that follow give evidence that theory of mind research touches cognitive, social, and linguistic development from infancy onwards. To date, there has been little attempt to answer the question of how these important developments come about. Because the mental state of another is the very prototype of an unobservable, explaining how the child becomes aware of their existence is not a simple task. The chapters in this book propose a variety of possibilities while extending what is known about the implications of the development of a theory of mind.

The question of developmental precursors is directly addressed in

several chapters. Frye (chapter 2) argues that the ability to act intentionally is a prerequisite for a theory of mind and, further, that being able to act intentionally allows the child to draw a clear distinction between the social and physical worlds. The infant comes to understand that certain kinds of means (e.g., gestures) are appropriate for achieving social ends, whereas other means (e.g., physical manipulation) are more appropriate for achieving physical ends. Identifying means and ends allows the child to recognize that others are also acting intentionally, or doing one thing in order to achieve something else. Not until such understanding is in place will the child be capable of intentional social interaction resulting in cooperation and competition.

Premack (chapter 3) describes a very different possibility for the origins of the child's theory of mind. He proposes that infants are able to perceive intention directly from patterns of movement. Only objects that are self-propelled will be identified as agents or as capable of having goals. He is able to show, just from an analysis of an agent's movements, how the infant might put a value on what the agent is doing. The infant's perception of intention and interpretation of the valence of the agent's movements are not sufficient to support a full theory of mind. They will not, for example, allow the infant to understand beliefs, but they are the bottom rungs in the climb from perception to interpretation to conceptual understanding of others.

Communication and language offer other explanations of the development of the theory of mind. In a systematic review of the early communication literature, Bretherton (chapter 4) finds evidence that infants begin to be aware of the mental states of others when they begin to communicate at about 9 months. Communication requires intersubjectivity, or shared representation and reference. As Bretherton puts it, infants must make a "rich interpretation" of adult messages as much as adults must make one of infant messages. That there is successful communication at this age implies that the infant has some awareness of the point of view of the other. Bretherton goes on to link the changes in the child's theory of mind with the increasing precision and power of the child's fast-developing linguistic abilities.

Beckwith (chapter 5) comes to the child's theory of mind through another aspect of language. He asks how it is possible for children to learn terms with abstract reference. The example he considers is that of emotion. How do young children learn terms for emotions when the feelings of another cannot be directly perceived? To answer, he introduces the perspective of nominalist bootstrapping, which says that children initially learn about the behavioral and situational aspects of emotions; later, this knowledge deepens into an understanding of others' emotions as mental states through reasoning about the child's

own emotions. In other words, children form a theory of other minds by analogy with their own.

The relevance of theory of mind to social development has remained largely unexplored to date, despite the apparent importance of a theory of mind as a social tool. Two general issues are prominent here. Firstly, what, if any, is the role of the social world in the development of the child's theory of mind? Secondly, what does the developing understanding of mental states do for the social life of the child? The answers to these two questions will almost certainly be inextricably linked, and several chapters go some way toward unravelling these issues.

Dunn (chapter 6) considers the social life and world of the family from this perspective. The ability of young children to read and react to the emotions and intentions of family members seems to be in advance of what they are able to do in experimental laboratory conditions. Dunn furnishes diverse examples from episodes of teasing, giving of excuses, and cooperative pretend play. She advances the idea that children may make early strides in understanding the feeling states and actions of family members because what happens in the family is of real affective significance to the child. Moreover, there is evidence that children from families who talk about inner states and motives are themselves likely to do so earlier on.

In one part of her chapter, Hay (chapter 7) demonstrates how children might learn the use of mental terms from older models. Her extensive line of studies on imitation have shown it to be a form of learning that is selective, sociable, and creative. When young children imitate, they do not just copy others' movements but seem to take into account the point of the action. Hay offers a new analysis of imitation and of the early formation of the child's theory of mind based on the child's attempts to recognize and act on their own and others' desires.

The relationship of children's understanding of beliefs to their understanding of nonepistemic mental states, including desire and intention, generates further puzzles in metarepresentation, especially with respect to the watershed at 4 years. Previous results have shown that children seem to understand the nature of desire before belief (Wellman & Bartsch, 1988; Yuill, 1984). These results do not fit well with the logical structure of belief-desire reasoning, in that beliefs and desires appear to be symmetrical components of a theory of mind (Wellman & Bartsch, 1988).

In the present volume, Perner (chapter 8) attempts to resolve this issue by arguing that, in fact, the distinction established in the research is not between belief and desire but between different types of representation. Perner analyzes the various tasks to show that some require the child merely to represent situations, whereas others require the child