

Social Cognition

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Introduction

The term “social cognition” is deceptively simple. On the surface it refers to an understanding of the social world. Yet it hides a continuing debate between cognitive models of social behavior and development, and claims about the social origins of cognition. In this chapter we explicate and suggest an integration of these two approaches to development. A complete review of the complexities of this literature would be impossible within the framework of this chapter and there are many valiant attempts at such a summary of the history (e.g., Valsiner, 1998) and current research elsewhere (e.g., Bennett, 1992; Hala, 1997). Rather, we review the recent literature on children’s understanding of the mind; for the past 20 years this has been the crucible for a lively and often heated debate on the nature of social-cognitive development and its role in children’s developing competence in interacting with others.

We begin by tracing the cognitive and social approaches to the study of children’s social understanding. Piaget’s is usually assumed to be a prime example of a cognitive or individualistic approach to development and he is criticized for neglecting social factors in development, whereas Vygotskian theory is taken as a source of the social approach. However, in Piaget’s (1977/1995) “sociological studies” he claimed that social interaction is essential in the development of knowledge. He argued that individualism ignores the role of social life in development and collectivism provides no way to distinguish between collective beliefs that are or are not based on reason. As an alternative, Piaget argued for relationism, focusing on the relations between individuals as the basis of cognition. As Chapman (1991) pointed out, Piaget is now known for his later interest in subject–object interaction, yet his early work concerned the idea that interpersonal interaction is the source of intrapersonal reflection. His first two books were, ironically, criticized by Vygotsky (1934/1986) for neglecting the child’s interaction with objects. Vygotsky’s ideas about the

role of social interaction obviously preserved this relational approach and yet are often depicted in textbooks as the antithesis to Piaget's theory. We join other commentators in suggesting that they actually have much more in common than is often argued (L. Smith, 1996).

This apparent contrast between social and individual approaches to development filtered into the literature on social cognition. Such a division has become problematic in the current research on children's social understanding referred to under the banner "theories of mind." It is our contention that most approaches are individualistic in nature and minimize the social, even though many reject Piaget's theory (Perner, 1991). The alternative perspective rejects the cognitive approach to social cognition (e.g. Forrester, 1992) and is often seen as an enculturation approach in which children simply adopt cultural views about the mind.

The chapter is divided into five sections. The first briefly describes developments in the "theory-of-mind" literature over the past few years (for more extensive reviews see Lewis & Mitchell, 1994; Mitchell & Riggs, 2000; Zelazo, Astington, & Olson, 1999). The second section suggests that a crucial issue in the current literature concerns domain specificity in mental state understanding versus domain general processes of reasoning and executive function. Section 3 reviews critiques of the false-belief test and introduces social approaches to children's understanding of mental states. Section 4 explores recent theory and evidence suggesting a close relationship between "theory-of-mind" understanding and the child's interactions in her/his social world. As a result, the fifth part suggests that only a theoretical perspective based upon relationism can reveal the complete story of development.

Children's Understanding of Mind

The centrality of false belief

The focus of studies on the development of social cognitive skills has changed dramatically over the past 20 years. While some continuity is clear, Flavell and Miller (1998) suggest that there have been three shifts in interest. In the 1970s researchers explored the question of how and when children overcome an inherent egocentrism (see e.g., Shantz, 1983). This literature was replaced first by a short wave of research into the executive processes involved in monitoring and regulating one's activities, under the heading metacognition, and subsequently by the most recent phase of studies into the child's "theory of mind," which now dominates this area: "Indeed, it could be argued that it almost dominates the whole field of cognitive development" (Flavell, 1999, p. 23).

In most of the reviews a reader might gain the impression that the field was miraculously created either in 1978 upon the publication of Premack and Woodruff's target article concerning the question of whether chimpanzees had what the authors referred to as a "theory of mind," or a few years later with the publication of Wimmer and Perner's (1983) report of a false-belief task, based on suggestions from three philosophers commenting on Premack and Woodruff's article. Although these are not clear starting dates, it is agreed that the false-belief test has been central both as a critical test of developments which occur

in the preschool period and as a point of comparison for other developments.

There are two main versions of the false-belief test. In the *Unexpected Transfer* test, a character (e.g., Maxi) leaves an object, like a chocolate bar, in one location and while he is away it is moved to a new location. Since the protagonist did not see the change in location of his chocolate we expect him to act on his now outdated, and in fact false, belief and look in the old location for his chocolate. In the *Deceptive Box* test the child becomes the protagonist. She is shown a familiar looking (e.g., confectionery) box and asked what is inside. Having guessed that appropriate items would be inside (e.g., chocolates) and been shown that something else was present (e.g., pencils) the child is asked to recall what she had said/thought was inside and/or what someone else would think.

The counterintuitive, yet robust, finding is that young 3 year olds regularly fail these standard tests by claiming that Maxi would look in the new location for his chocolate, or that they and others would know the unexpected contents of the candy box. Four year olds generally realize that people have and act on false beliefs. Hundreds of research papers have used these procedures and a meta-analysis of over 50 of these shows that the 3–4-year shift is reliable (Wellman, Cross, & Watson, in press). In addition, children with autism tend to fail false-belief tasks until they reach a verbal age somewhat older than 5 years and/or a chronological age in the secondary school years (Baron-Cohen, Leslie, & Frith, 1985; Happé, 1995). However, there are deep divisions about why such a shift occurs.

Theoretical controversies

Since the Premack/Woodruff and Wimmer/Perner papers a deluge of research and theory has followed on the child's understanding of mind, not only within developmental psychology but also across other disciplines, particularly comparative psychology, philosophy, and cognitive science. One of the most interesting aspects of the development of the field is that there has always been dominant grouping of researchers and a healthy number of opposition groups. In the first volume of papers (Astington, Harris, & Olson, 1988), the majority subscribed to a belief that the development of an understanding of mind is theory like in so far as the child appears to develop a consistent set of principles about the working of the mind. These principles appear to change in the preschool years in the same way as a theory changes in science, through a conceptual shift at about the age of 4 when the false-belief test is passed.

The official opposition, led by Leslie (1987), contrasted the idea of theory change with a claim that an understanding of mind must be innately specified in a discrete mental module. The debate between Leslie and the majority greatly influenced the field over the late 1980s and 1990s. Leslie's work focused upon symbolic play, which he depicted as a precursor to a theory of mind: "The emergence of pretence is not seen as a development in the understanding of events and objects as such, but rather as the beginnings of a capacity to understand cognition itself. It is an early symptom of the human mind's ability to characterize and manipulate its own attitudes towards information" (Leslie, 1987, p. 416). Leslie's focus upon pretence was important for three reasons and each stems from the fact that it emerges so early in the child's development. First, it heralded a shift occurring elsewhere in developmental psychology toward a closer link between developmental theory

and cognitive science, somewhat at the expense of social processes. By focusing attention on a spontaneously emerging ability Leslie's theoretical analysis homes in on how the cognitive system computes relations between contrastive truth conditions – real versus imagined use of an object; true versus false beliefs etc. The debate on the mechanics of pretence narrowed most researchers' attention on children's understanding of the mind to the cognitive processes involved.

Secondly, the interest in the specific relationship between an understanding of mind and pretence led Harris (e.g., 1991) and others to suggest that both capacities reflect an ability to be flexible in one's imagination. He claimed that just as 18 month olds can use one object (e.g., a block of wood) as something else (e.g., as a "cup" to pretend to drink from), so too can the 4 year old come to imagine another's beliefs. Known as simulation theory, this approach attempted to avoid elaborate explanations for our understanding of mental states. All that is required is the ability to put yourself into the shoes of the protagonist and reason by analogy: children "need only imagine another person – or their past self – aiming or failing to aim their mental arrows of seeing, expecting, knowing, liking and wanting at specific targets within a set of possible targets" (Harris, 1991, p. 292). A great deal of theoretical debate between simulation theory and the main group who coined the term theory of mind culminated in the early 1990s in a series of conferences in which most authors came to the conclusion that an understanding of the mind is likely to involve both theory-like understanding and the imagination (Carruthers & Smith, 1996; Davies & Stone, 1995).

Thirdly, Leslie's theoretical analysis of play reflected a move to explain "the human mind's ability to characterize and manipulate its own attitudes towards information." His claim of an innate propensity to understand mental states or "theory of mind mechanism" (ToMM) suggests that an ability to understand mental states emerges early but is constrained by a gradually developing information-processing device, labeled the Selection Processor (Leslie, 1994). Thus the developmental issues, according to this approach, concern information-processing capacity rather than the construction of an understanding of the mind as a separate entity. This approach, often referred to as the Innate Module account, contrasts with the view that the child constructs theory-like understanding of mental representations. This latter perspective is known as the Theory Theory, but there are a number of understandings of what the child's theory might be like and we will describe two briefly here. The first is that of Josef Perner (1991) who, in keeping with Leslie, suggests that central to understanding the child's social-cognitive skills is the ability to understand that mental states serve a representational function. Unlike Leslie he claims that the realization that the mind is an active entity is constructed by the child and has a profound influence upon the child's understanding. This results in a theory-like shift: "One can think of the concept of 'representation' as playing a catalytic role in children's reconceptualisation of what the mind is, similar to the catalytic role that important scientific concepts play in the development of new scientific concepts" (Perner, 1991, p. 11).

The other main interpretation of the term Theory Theory derives largely from the work of Henry Wellman (e.g., 1990). He claims that children have to make ontological distinctions between the plethora of mental states which are identified in natural language – beliefs, emotion states, desires, values, intentions, etc. – and they have to construct an understanding of each into a causal explanatory framework. Wellman (1990) suggests that

children develop an understanding of the mind based initially on desires and that in the third year of life this transforms into a belief–desire framework. This approach is supported by evidence from a number of areas (see Wellman & Lagattuta, 2000, for a review) including language development, which shows that desire terms like “want” emerge before belief terms like “think” and that they gradually become used in a way which suggests an understanding of false beliefs (e.g., Bartsch & Wellman, 1995).

A theoretical impasse?

A major reason why the child’s understanding of mind has received so much attention centers around the elegance of the three mainstream theories which have been put forward. Each of the perspectives – the Simulation, “Theory”, and Innate Module – provides us with an interesting process model of the development of social-cognitive skills and the debate between each has been both stimulating and insightful. However, this has had the effect of narrowing the focus two ways. First, there is the presumption that these are “the only games in town” as one of the players in the field has arrogantly put it. The main debate has often been very inward looking as a result. Secondly, the nature of exchange between the various camps has resulted in two types of conclusion. As stated above the simulation–theory debate has led to something of a coalescence between the two. The theory–innate module debate has been more divisive, in that they are mutually exclusive, to the extent that there appears to be so little common ground between them that each interprets the same data in radically different ways, each effectively denying the claims of the other. So, for example, German and Leslie (2000) have recently claimed (not for the first time) that the theory approach has not shown how a single mental state concept is constructed by children, how the proposed sequences of theoretical constructs might take place, or the nature of the critical evidence which might effect a paradigm shift in the child’s theoretical stance. Critics of the innate module approach have stressed that it does not appear not to explain the shift which occurs at around age 4 (Frye, 2000; Wellman et al., in press) and that the evidence from evolution does not support the idea of the emergence of a specifically human ability to understand mental states (Moore, 1996; Tomasello, 1999). More recently, the debate has turned in a different direction.

Current Cognitive Positions

Over the past decade the cognitive debate concerning children’s understanding of mind has shifted away from an exclusive analysis of the nature and origins of mental-state understanding to a fierce debate over the relation between this domain-specific skill and other more domain-general abilities. Although there are many variations within each position (e.g., Mitchell & Riggs, 2000), two main perspectives have emerged in opposition to the theory-of-mind perspective advocated by Perner. The first we call the reasoning position, while the second concerns the development of executive control.

Reasoning and mental-state understanding

In the mid-1990s the false-belief task came under a great deal of critical scrutiny from a number of groups who argued that children find this test difficult because it requires the comparison of a set of contrasting hypothetical premises. For example, Frye, Zelazo, and Palfai (1995) found that success on a false-belief task correlated with an ability to perform a card-sort task in which children were required to switch from one rule to another, incompatible rule. In one experiment the children had to sort a group of blue and red pictures, some of which were boats and the rest were flowers. When told that they were now going to play the “shape game,” 3 year olds continued to sort by color even when explicitly told to “Put the flowers here; put the boats here.” According to the cognitive complexity and control (CCC) theory 3 year olds cannot deliberately contrast two contradictory rules. This skill emerges with the development of other skills, notably working memory, which permit successively higher levels of understanding of conscious control (Zelazo, 2000).

At the same time Riggs, Peterson, Robinson, and Mitchell (1998) explored the relation between false-belief understanding and reasoning in comparable tasks which do not involve mental states. For example, they gave children a variant on the unexpected transfer test in which John’s coveted chocolate is used by his mother to make a cake. Children’s performance was almost identical on a false-belief question (“Where will John look for the chocolate?”) and a question which asks children to make a hypothetical or counterfactual contrast (“If Mummy had not baked the cake, where would the chocolate be?”). This latter question relies upon children’s ability to reason from false premises, but ones that are not contingent upon an understanding of the protagonist’s mental states.

The work on reasoning has led to a heated chicken and egg discussion (see chapters 5, 6, & 18 in Mitchell & Riggs, 2000), in which each logical position (that an understanding of counterfactuals causes a representational theory of mind, that the representations come first, or that they both depend on some other influence like processing capacity) has been suggested and debated.

Executive control

Research inspired by studies of the relationship between cognitive performance and neurological functioning gave rise to the claim that false-belief tasks require the inhibition of the prepotent response to say where the chocolate is or what is inside the deceptive box. Early evidence came from work with autistic children in which it was found that success on a battery of false-belief tasks correlated with the ability to switch rules on a card-sort task and carry out a planned sequence of actions on the Tower of Hanoi, in which the child has to move a set of disks from one pole to two others to match an array presented by the experimenter (Ozonoff, Pennington, & Rogers, 1991). At the same time Russell developed a procedure in which children had to deceive an experimenter into selecting the empty box in successive trials where a reward was placed in one of two boxes. Known as the windows task it was found that if the child could see into the boxes, 3 year olds and older children with autism persisted in telling the experimenter to open the baited box on up to 20

successive trials even though they were “punished” on each trial by not getting the reward (Russell, Mauthner, Sharpe, & Tidswell, 1991).

Two developments are noteworthy. First, the association between false-belief understanding and executive control has led to a close analysis of the nature of the latter. It has been shown that there are at least three skills involved – inhibitory control, attentional flexibility, and working memory (following Welsh, Pennington, & Grossier, 1991). Claire Hughes (1998) has provided evidence suggesting that different executive skills relate to particular aspects of social understanding. In particular, the ability to deceive appears to be related to the ability to inhibit a prepotent response.

Secondly, the literature has led to a reconsideration of theory in the area, particularly in light of Jim Russell’s (1996) book *Agency*. One problem with research showing a relation between two functions like executive skills and false belief is that a causal relationship is not implied. Some, like Ozonoff et al. (1991), assumed that both are controlled by the development of the same area of the prefrontal cortex, but such accounts pinpoint possible functional relatedness, not necessarily a causal link between them. Russell claims that executive functions are important in theory-of-mind development, but he is careful to draw together many of the ideas in the theories discussed in section 2. He attempts to provide an a priori case for the coexistence of a few innate skills (what he terms “minimal vitalism”), a connectionist approach to the development (at a subsymbolic level rather than a theoretical level as described by Theory Theory) and the construction of an understanding of the mind as a representational system in keeping with Perner’s (1991) theory. However, unlike Perner, he argues that a grasp of false belief, like other major achievements (notably object permanence), is part of a general process by which the child constructs a sense of self-awareness and a self-world dualism as defined by Piaget.

Whither?

The research on domain-general reasoning and the development of executive control has led to a debate which echoes that between the theoretical positions discussed in section 2. On both topics there are several “camps” (see Perner, 2000; Perner & Lang, 2000). However, the safest conjecture seems to be on theoretical accounts of the development of social skills that do not naively assume that the child constructs a theory-like understanding of the mind, but which attempt to account for the parallel achievements. Russell’s (1999) idea of an active agent reintroduces Piagetian theory, although only in a “homeopathic dose.” Perner’s (Perner & Lang, 2000) view is that the acquisition of a representational theory of mind is a precursor to other skills. However, we believe that another, complementary, approach is required.

There is More to Social Cognition than the False-Belief Test

Thus far we have focused on “mainstream” approaches. However, there has always been a diversity of opinion and we now attempt to piece together an account of the “social”

approach to development. In this section we re-examine the false-belief task from this perspective, and review evidence of the many correlates of false-belief performance which put social explanations squarely on the agenda.

Re-analysis of the false-belief test

In addressing the question of whether the false-belief test should be the primary measure of mental-state understanding many researchers have found that modifying the procedure allows younger children to demonstrate a competence which appeared lacking when the standard procedures are employed (e.g., sections 4 & 5 in Lewis & Mitchell, 1994). These experiments are often perceived by theory theorists as attempts to undermine the theory-of-mind enterprise by showing that no developmental shifts take place (e.g., Perner, 2000, pp. 368–375). Indeed some researchers have attempted to show that the test is unreliable (Mayes, Klin, Tercyak, Cicchetti, & Cohen, 1996), but others find sufficient reliability (Hughes, Adlam, Happé, Jackson, Taylor, & Caspi, 2000). However, most have modified the tasks in order to identify the factors that are important in the development of the child's understanding of mind.

Three year olds can act to deceive another person (e.g., Chandler, Fritz, & Hala, 1989) even though they appear to be readily confused into deceiving someone they are supposed to help (Sodian, 1994). They perform better when they act out the protagonist's search pattern (Freeman, Lewis, & Doherty, 1991), if they are actively involved (Hala & Chandler, 1996), if their earlier mental state is made salient by a pictorial cue (Freeman & Lacohee, 1995; Mitchell & Lacohee, 1991), if they are familiar with the "narrative" of the unexpected transfer procedure (Lewis, Freeman, Hagestadt, & Douglas, 1994), or if the test question is phrased so that it refers to a specific point in time (Lewis & Osborne, 1990).

There has been much debate about the importance of these modifications of false-belief tasks. Wellman et al.'s (in press) meta-analysis has been helpful in teasing apart the factors which reliably facilitate performance. Examining 178 experiments with 591 conditions across a range of (mainly industrial) countries, they found that factors like the type of task used, or whether the target question focused on the protagonist's thoughts or actions, did not vary systematically across studies. Five factors did show significantly improved performance in preschoolers across studies: a motive for the protagonist is made explicit; the child actively participates in the procedure; the object is either not shown to the child or is destroyed (i.e., eaten) before the test question is asked; the protagonist's mental state is made salient – for example by the child being told that Maxi is gone and cannot see the object being moved; the child is shown a picture which represents the protagonist's belief or is reminded of it. None of these factors interacted with age. This suggests that none has a magic effect of revealing false-belief understanding which is hidden in standard procedures. Indeed Wellman et al. found consistent improvement across the fifth year of life, suggesting that the task does assess a skill which is mastered at about this time. Only one factor, temporal marking (following Lewis & Osborne, 1990), interacted with age, but this seemed to show greater effects in older, not younger, preschoolers.

The Wellman et al. meta-analysis seems to validate the false-belief procedure as a means

of demonstrating the development of mental-state understanding at around age 4. However, the range of factors which have been shown consistently to relate to children's success suggest that performance on the test is contingent upon the nature of experimenter-child interaction, as we see in the influence of, for example, the adults' questioning of the child or casting the test as a competitive game. It thus seems fair to suggest that such variations give us insights into the *social* nature of early social cognitive development.

Social correlates of mental-state understanding

The theory-of-mind tradition has long been criticized for being too individualistic (Bruner, 1990; Raver & Leadbeater, 1993), although it has been reluctant to address this criticism. However, in the mid-1990s a quest to explore individual differences in false-belief performance put social factors squarely on the map even within the theory-of-mind camp.

In one of the early demonstrations that social interaction influences the development of social understanding, Perner, Ruffman, and Leekam (1994) reported that children with siblings passed false-belief tests up to a year before children without siblings. Subsequent research has extended and complicated the "sibling effect." For a start, in middle-class homes, the presence of older siblings, more than younger ones, has been more consistently found to predict false-belief performance (Jenkins & Astington 1996; Lewis, Freeman, Kyriakidou, Maridaki-Kassotiaki, & Berridge, 1996; Ruffman, Perner, Naito, & Parkin, 1998). However, some studies suggest that the frequency of daily interactions with older kin (Lewis et al., 1996) or the child's language level (Jenkins & Astington, 1996) were stronger predictors. More recent studies of working-class children have failed to replicate the sibling effect (Cole & Mitchell, 2000; Cutting & Dunn, 1999) and suggest a later onset of false-belief success in impoverished children (Holmes, Black, & Miller, 1996).

As well as the influence of social background and poverty on social cognitive development, culture also seems to be important. Wellman et al.'s (in press) meta-analysis shows small but statistically significant differences in age of acquisition across cultures which are mainly similar in their levels of industrialization. Vinden (1996) reported that false-belief performance in Quechuan people of Peru lagged behind Western children by at least 3 years (and possibly much longer), perhaps because their language appears not to refer directly to mental states. A more recent study shows that among the Tainae people of Papua, New Guinea, even 15 year olds were at chance when asked about another's thoughts (Vinden, 1999).

These data on siblings, social class, and cultural differences pinpoint a glaring weakness in the literature on theory of mind. It purports to provide insights into the social functioning of children, yet it rarely compares children's social interaction with their performance on false-belief tests. The "sibling effect" raises much speculation about possible influences but tells us little about how social interaction influences social-cognitive development. To address this question we need to turn to additional evidence.

“One miracle”?: From infancy to adolescence

One problem with the literature is that false-belief understanding is treated as a fulcrum around which development takes place. Chandler (e.g., 1988) has long criticized what he refers to as the “one miracle” view of development, that false-belief understanding is the major step into a “theory of mind” which is essentially equivalent to adults’ understanding. This assumption has been attacked from two sides. First, there has been growing interest in obtaining a more complete view of children’s social-cognitive development by studying infants’ joint attention behaviors that seem to indicate some level of social understanding (e.g., Moore & Dunham, 1995).

Secondly, attention has turned to developments in children’s social understanding beyond false-belief understanding. The term “interpretation” has featured centrally in discussion of developments after the preschool years. Some researchers argue that passing a false-belief test or related theory-of-mind tasks already indicates an understanding of interpretation (e.g., Perner, 1991). Others argue for a distinction between understanding that beliefs depend on having access to information (i.e., false-belief comprehension) and the more complex understanding that even with access to the same information people may interpret it differently and, thus, end up with different beliefs, an insight achieved several years after false-belief understanding (Carpendale & Chandler, 1996; Chandler & Carpendale, 1998; Chandler & Lalonde, 1996). A related insight, also achieved some years after false-belief understanding, is the understanding that people’s interpretation of an ambiguous social event may be biased by their previous expectations about the people involved (Pillow, 1991). Further mentalistic insights that preschoolers still have to acquire include their understanding of the nature of thinking (Flavell, Green, & Flavell, 1995), and inference (Varouxaki, Freeman, Peters, & Lewis, 1999).

This research on older children alerts us to a need to tie the explosion of theory-of-mind research into both a longer time perspective and the wider tradition of social-cognitive studies. However, the field is only now beginning to explore some of these potential connections. Dunn (1996) and others have called for research on connections between theory of mind and other aspects of children’s development such as morality and emotional understanding. Competence in social understanding may be important for a number of different aspects of development such as self-awareness (Chandler & Carpendale, 1998), drawing inferences regarding social situations and the pragmatics of interaction.

Some recent work suggests a relationship between false-belief understanding and wider social skills. For example, young children’s performance on false-belief tests was found to be positively correlated with teacher ratings of social skills (Lalonde & Chandler, 1995; Watson, Nixon, Wilson, & Capage, 1999). But with preadolescents, peers’ ratings were related to social understanding, not teacher ratings (Bosacki & Astington, 1999). As Watson et al. acknowledge, these studies are correlational and give rise to many possible explanations. Competence in mentalistic understanding could lead to improved social skills, or children who are involved in more social interaction may develop more competence in understanding the mental world. Alternatively, a third factor involving children’s family background may facilitate development of mentalistic understanding and social skills. Even more likely perhaps, this relationship may be bidirectional. That is, involvement in more

social interaction facilitates more understanding and this in turn leads to more successful interaction with peers. Such speculation, of course, requires evaluation with longitudinal and experimental research.

Recent research has attempted to use the theory of mind to examine real-world issues like bullying. Sutton, Smith, and Swettenham (1999) argue that the image of the bully as socially naive is not based on good research and they report evidence that, in fact, bullies tend to score higher on measures of social understanding. This type of research demonstrates the close connection between social understanding and morality (Chandler, Sokol, & Wainryb, 2000), but here more conceptual and empirical work is needed.

Social Interaction and Social-Cognitive Development

Recent links made between children's understanding of the mind and other social skills are symptomatic of a move toward a more consolidated theory which integrates the two. In this section we describe what we feel is an emerging, or continuing, consensus in the field. First we report the longitudinal evidence which shows that mental-state understanding at age 4 seems to be related to patterns in the child's earlier relationships. Secondly we home in on language as the main means by which children come to develop this understanding.

Longitudinal patterns

Longitudinal research suggests that factors in the child's early relationships are important predictors of earlier false-belief understanding. In the area of family relationships, not only is concurrent attachment security related to theory-of-mind performance (Fonagy, Redfern, & Charman, 1997), but similar results are found in longitudinal studies (Symons & Clark, 2000). For example, Meins (1997) found that children who were securely attached at 11 to 13 months were more likely than insecurely attached children to pass a false-belief task at 4 years, and more complex tasks at 5 years. However, a number of explanations are possible and even more complexity in research design is required to tease apart possible lines of causality. Here the work of Dunn has been seminal.

In a series of longitudinal studies, Dunn and her colleagues found that a number of factors in family interactions predict levels of performance in theory-of-mind tasks. For example, cooperative interaction between siblings at 33 months was positively related to belief understanding at 40 months (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). The most consistent link in Dunn's and related research is between family talk about mental states and children's social understanding (e.g., Brown, Donelan-McCall, & Dunn, 1996; Dunn, 1996). In one of the first of these studies, Dunn et al. (1991) found that children who at 33 months participated more in family talk about emotions and the causes of behavior were more competent on a test of belief understanding 7 months later. Similar results were found in another longitudinal study in which mothers' use of mental-state terms was associated with their child's later competence in understanding belief (Moore, Furrow, Chiasson, & Patriquin, 1994). Much of this initial research has focused on words

that are clearly mental-state terms, but some words may be important in learning about the mind even if they are not obviously mental-state terms such as “see,” “look,” or “hide” (Turnbull & Carpendale, 1999). Competence in understanding belief is also associated with mothers who report asking their children to reflect on others’ mental states and feelings in disciplinary situations (Ruffman, Perner, & Parkin 1999), and with mothers who treat their children as individuals with minds (Meins & Fernyhough, 1999).

Another source of evidence for the role of language comes from research showing that deaf children tend to be delayed in false-belief understanding (Peterson & Siegal, 2000). This seems to be because most of these children have hearing parents who are not fluent in sign language, and thus there is no shared language complex enough to talk about inner states. In contrast, deaf children with deaf parents who are competent users of sign language may not be delayed. Peterson and Siegal (2000) have now reviewed 11 studies that support these conclusions and point to the role of conversation in the development of false-belief understanding.

If family talk about mental states is important in the development of social understanding then we might expect that suitable training or teaching might facilitate such development, and this approach has demonstrated some success. For example, Appleton and Reddy (1996) found that discussion of situations involving false beliefs led to 3 year olds’ success on post tests and to generalize this insight to other tests of belief understanding beyond the training situations.

The studies described here conflict with ones which rely on laboratory procedures in that they suggest that young children who consistently fail standard false-belief tasks may still appear to engage in a wide variety of acts such as deception that seem to reflect some mentalistic understanding (e.g., Newton, Reddy, & Bull, 2000). Such evidence contrasts with the idea of a sudden shift into an understanding of false beliefs. For example, Newton et al.’s close observations of a 2 year old suggest that deception skills emerge from pragmatic need at around the second birthday rather than as a result of a conceptual miracle. Instead, such data support the theoretical claims regarding gradual development of concepts concerning the mind (Russell, 1996; Woodfield, 1996).

Language and social understanding

Evidence of the role of family talk about the mental world in the development of social understanding has led many to the more general issue of the relationship between language and social understanding (e.g., P. K. Smith, 1996). Several researchers have reported that false-belief understanding is closely related to language ability, assessed with various measures (e.g., Cutting & Dunn, 1999; Happé, 1995; Jenkins & Astington, 1996). Further, children with autism have problems with both language and theory-of-mind tasks. There are a number of possible relations between language and social understanding more generally, and false-belief understanding specifically. Language may reveal children’s understanding, but language may also be a context for the development of understanding.

Children’s talk about mental states can provide a window on their social understanding. For example, Bartsch and Wellman’s (1995) exploration of the CHILDES database revealed that children consistently use desire terms like “want” at a younger age than belief

terms like “think.” Although they use this in support of their claim for the development of a desire-based theory as a precursor to a belief–desire theory, other explanations are possible. For example, Harris (1996) suggests that it is conversation, not word use, that is an important context in which children learn about beliefs (see also Tomasello, 1999, pp. 176–178). Here language is considered a context for development. In particular, Harris argues that information is exchanged in conversation, which should be a constant demonstration that people differ in what they think, believe, and know about a topic.

Another aspect of language that may be important in learning about mental states is syntax. De Villiers and de Villiers (2000) argue that language provides a syntactical structure, known as complementation, with which to talk about mental states. For example, in “He thought it was a lion” (de Villiers & de Villiers, 2000, p. 196), the overall sentence can be true although the embedded complement (“it was a lion”) can be false. In this view, a grasp of language is required for social-cognitive development because it provides a syntactical structure for thinking about false beliefs. However, there is controversy over whether this aspect of syntax provides a necessary or a sufficient condition for grasping false belief (Astington & Jenkins, 1999).

The current longitudinal evidence on language and theory of mind suggests that earlier language abilities predict later performance on false-belief tests, but not vice versa (Astington & Jenkins, 1999). Such results support the view that theory of mind depends on language, at least when the former is defined by false-belief understanding. If we consider social understanding more generally, then it may be that some initial level of social understanding is required in order to achieve joint attention and determine others’ referential intent in the process of word learning. Beyond this, language may be an important context in which to learn how to talk about and reflect on inner experience.

The first two possibilities considered by Astington and Jenkins – that theory of mind depends on language, or that language depends on theory of mind – assume that these two abilities are separable. Instead, others argue that they are inextricably intertwined. Arguments from Wittgenstein suggest that thinking about the mental world is not separate from learning to talk about the mental world (Turnbull & Carpendale, 1999; submitted). Several authors have pointed out that Wittgenstein’s (1968) private language argument is an argument against the view, based on simulation theory, that children learn about the mind through introspection (Chapman, 1987; Montgomery, 1997; Russell, 1996). Instead, public criteria are needed in order to learn the meaning of mental-state terms. Criteria are those public circumstances in which it is appropriate to use certain mental-state terms (Chapman, 1987). In the case of psychological terms such as “look,” “want,” “think,” “guess,” and “forget” the criteria that justify their use are actions. Children learn the use and meaning of mental-state terms through the process of the words being grafted onto earlier or more primitive behavior (Hacker, 1997; Turnbull & Carpendale, submitted). The conclusion following from this argument is that developing social understanding is fundamentally social because children must learn the meaning of mental-state terms within family talk about the mental world.

Conclusion: Integrating the Social and Cognitive Approaches

In this chapter we have explicated two contrasting views of social cognition, that have long been present within the literature but which have manifested themselves in particular ways in recent years. As we have suggested in sections 2 and 3, much of the debate on the child's understanding of mind concerns the nature of her/his "representation" of mental states. This once focused on whether they are innate, constructed in a theoretical way, or simply simulated, but in recent years has concerned, firstly, whether a representational theory of mind (Perner, 1991) is distinct from other types of counterfactual thinking and, secondly, how it relates to other higher order or executive thinking skills. In section 4 we have tried to return the social dimension to the term social cognition by showing that the child's entry into an understanding is grounded in her/his communication with others.

We conclude by suggesting that the cognitive and social approaches be integrated. Calls for such an integration have come from both within (Astington & Olson, 1995; Vinden & Astington, 2000) and outside (Raver & Leadbeater, 1993) the theory-of-mind movement. We need a theory that takes the role of social interaction seriously, yet is not a simple enculturation position, according to which children passively adopt culturally available concepts concerning the mind. We suggest that Chapman's (1991, 1999) integration of the Piagetian and Vygotskian ideas mentioned at the start of this chapter may provide a suitable framework within which to integrate the individual and social aspects of the development of social understanding.

Chapman (1991) suggested that integrating Piaget's early work on the notion that argumentation is the source of reflective thought with his later interest in subject-object interaction into a single system results in an "epistemic triangle" involving triadic interaction between the self, others, and the world. Vygotsky's ideas concerning the role of social interaction are also preserved in this approach. From this perspective, the development of children's social understanding occurs within triadic interaction involving the child's experience of the world as well as her communicative interaction with others about their, often differing, experience and beliefs. This essential role of social interaction implies that the extent and nature of the interaction children experience will influence the development of their social understanding. More interaction and talk about the mental world should facilitate the development of social understanding through learning the criteria for mental state terms. Aspects of relationships such as cooperation that influence children's understanding of others' perspectives should also facilitate development. These expectations are consistent with the research reviewed above. Vygotsky's concept of the zone of proximal development is also important in this context because it is helpful in thinking about a gradual process of development and the role of adults in supporting such development. This is a perspective that has been lacking in the field and may be helpful in making sense of the gap between naturalistic observation and experimental evidence of belief understanding.

There are several approaches within the field that are consistent with such a framework. For example, Fernyhough's (1996) Vygotskian account is not an enculturation view, but rather proposes that children develop a dialogical form of thinking through internalizing interpersonal dialogue. This form of thinking, involving the ability to consider more than one perspective, is required in situations involving false beliefs. Hobson's (1993) work also

has much in common, in fact he proposes a “relatedness triangle,” similar to Chapman’s epistemic triangle. Hobson argues that the capacity for symbolism arises in the interpersonal activity of relating to others about their attitudes to objects. That is, symbolic thought follows developmentally from symbolic communication. This is based on the Vygotskian (1934/1986) insight that higher mental functions arise through the internalization of social interaction. Similarly, Tomasello (1999) argues against the common view of linguistic reference as a connection between the symbol and the referent. Instead, Tomasello writes about a “referential triangle” – consistent with Chapman (1991) and Hobson (1993) – and he argues that “reference is a *social* act in which one person attempts to get another person to focus her attention on something in the world” (p. 97). This species-unique capacity for reference allows children to participate in language and culture, and to take advantage of cultural learning.

The essence of the approaches discussed in this section is that they are relational in nature and assume that development occurs in social interaction. The individual characteristics and capabilities of the child as well as of the other people involved contribute to this interaction – that is, they respond to each other. Social cognition develops within the relations between the child and others, and it is central to human life.

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