Developing Theories of Intention

Social Understanding and Self-Control

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LEA LAWRENCE ERLBAUM ASSOCIATES, PUBLISHERS
1999 Mahwah, New Jersey London

Toddlers' Understanding of Intentions, Desires, and Emotions: Explorations of the Dark Ages

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Our sensory experience of other people tells us about their movements in space but does not tell us directly about their mental states. Although a few radical philosophers and psychologists may deny the existence of mental states, most regular "folk" feel sure that they themselves and others have them. It is adaptive to read another person's mental state because it allows us to explain the actions they have taken in the past and predict their actions in the future. The general aim of "theory-of-mind" research is to illuminate the development of this everyday, folk psychological framework for understanding people (e.g., Astington & Gopnik, 1991b; Astington, Harris, & Olson, 1988; Flavell & Miller, 1998; Perner, 1991; Taylor, 1996; Wellman, 1990).

This research has taught us that children's understanding of mental life is not all of one piece. There is no single moment at which children develop a theory of mind. Instead, children gradually converge on an adult understanding of mind. The focus on when children understand "false belief" has been misleading in this regard. Beliefs are only one of many mental states that children understand and use in their everyday interactions with people. Children may only develop a firm understanding of false beliefs at about 4 years old, but they have started on their path of developing a folk psychological understanding of people much earlier. Preschoolers understand a great deal about perceiving, wanting, and intending at an age when they still have only a shaky understanding of false beliefs (e.g., Astington & Gopnik, 1991a; Flavell, Flavell, Green, & Moses, 1990; Gopnik & Slaughter, 1991; Gopnik, Slaughter, & Meltzoff, 1994; Wellman, 1990, 1993).

However, just as it is a distortion to think that children don't have an understanding of mind until they pass a false-belief exam, it is likewise a distortion to hold that infants have the adult conception of the mind as soon as they show a special interest in people. An alternative is a genuinely developmental account of children's understanding of the mind. The view we favor is that infants are given a jump start in understanding people because of certain innate structures, but they gradually come to understand the whole range of psychological flora and fauna including pretenses, images, emotions, perceptions, desires, intentions, and beliefs. Newborns do not have anything like this full understanding of the mind, but they do have privileged ways of understanding other people and human acts.

In earlier work, we argued that infant imitation may provide the first groundwork for later understanding of the mind (Gopnik & Meltzoff, 1994; Meltzoff & Gopnik, 1993). Imitation is a behavioral measure indicating that newborns, at some level of processing no matter how primitive, can map actions of other people onto actions of their own body. The findings of early imitation have now been replicated and extended in 25 different studies from 13 independent laboratories, both in this country and cross-culturally (for a history and literature review, see Meltzoff & Moore, 1977, 1994, 1997).

A comprehensive model of early imitation was offered by Meltzoff and Moore (1997) and dubbed the AIM (active intermodal mapping) model. The central notion is that imitation, even early imitation, is a matching-to-target process. The goal or behavioral target is specified visually. Infants' self-produced movements provide proprioceptive feedback that can be compared to the visually specified target. AIM proposes that when babies imitate, they are linking the visual appearance of other people to their own internal kinesthetic and proprioceptive feelings, connecting the visible bodily actions of others and their own internal states.

This type of initial state would provide a jump start for infants' understanding of persons and commonsense psychology because it provides the first and most fundamental building block of the folk psychological framework: "Those entities are like me." Thus, when newborns look at the moving adults, they do not simply see "visual complexity," "high-contrast areas," or mere physical motions, but special acts that are like the acts they can and do perform. Newborns are not alone; they perceive that other entity is "like me."[1]

[1]In using the English word "me," we do not suggest that the infant has the full-fledged adult sense of self. Indeed, we have argued that such a sense of self is a developmental product (Meltzoff & Moore, 1995). Our argument could be rephrased by purging the "me" word and instead saying, "*That* looks like *this* feels." Elsewhere we have attempted to describe the initial state in a precise technical manner, using a computational model and avoiding the glosses of everyday English (Meltzoff & Moore, 1997). Interested readers are referred to this work for detailed arguments about early self-other relations.

Development in social cognition depends on two-way traffic between self and other, on what might be called "projection" from one's own case to the other and "appropriation" from the other to the self. But this depends on a prior assumption that self and other have anything whatever to do with one another. Newborn imitation provides a demonstration that at some primitive level this link has been made in the normal infant. Without this fundamental connectedness, there would be no reasoning bidirectionally from one's own case to another's because the two cases would not be known to be similar (Meltzoff & Moore, 1995).

Regardless of our theory about the initial state, there is, admittedly, a substantial gap in the findings between early infancy and early childhood. We know something about the initial state of newborns from studying imitation and other early phenomena like interactional synchrony and face recognition. We know something about the state of 3-year-olds who are on the verge of understanding belief. However, "the dark ages," from about 15 to 36 months, remain something of a mystery. Ask graduate students to test 2-year-olds and they will often shudder and scurry out of the lab; the "terrible-twos" lead to both subject and graduate student attrition. In the dark ages, the established techniques of infancy (e.g., preference-for-novelty procedures) do not work because the children are too old to sit and passively watch; conversely, tests demanding subtle verbal distinctions do not work ("When I first asked you, before we did X, what did you believe. . . ."), because toddlers are too young for such verbal gymnastics. We're left guessing. The absence of empirical findings from this period has contributed to our difficulty in laying out a fine-grained developmental theory. It is as if biologists had only seen frogs and tadpoles without the transitions in between. It would be hard to tell a developmental story, and no one would believe it if you did.[2]

A variety of techniques, however, have recently been developed to test children during the dark ages. One set of techniques uses toddlers' language abilities. Such studies suggest, for example, that 18-month-old children understand that words refer to objects and can use an adult's attentional cues (e.g., gaze direction, gestures) to identify the referent of a novel label (e.g., Baldwin, 1993a, 1993b; Baldwin et al., 1996). At a similar age, children also take into account the intentions of the other person in their attempts to determine the referent of a novel word (e.g., Tomasello, 1995; Tomasello

[2]We do not mean to imply that there has been no work in the 15- to 36-month-old age range. There has been a great deal of work (e.g. Damon, 1998; Kagan, 1981), but not much from the "theory-of-mind" viewpoint linking what infants know about persons and what 3- to 5-year-olds know about the intentional mental states of persons. Researchers have discovered a good deal about social cognition in infancy and a good deal about social cognition in 3- to 5-year-olds, but not enough about what happens in between. We expect that future research will shed increasing light on "the dark ages."

& Barton, 1994; Tomasello, Strosberg, & Akhtar, 1996). Finally, analyses of naturalistic studies of early conversation have illuminated children's understanding of the mind (e.g., Bartsch & Wellman, 1995).

A second newly developed technique, called the "behavioral reenactment procedure" (Meltzoff, 1995), also explores what children know about the mind, but does not rely on language. The behavioral reenactment procedure capitalizes on children's natural tendency to reenact or imitate the behaviors they see, but uses it in a more abstract way. A host of research indicates that children, even young infants, do not imitate by rote; they do not immediately imitate the events they see, but rather their interpretation of them (Meltzoff & Moore, 1995, 1997, 1998). This means that if we arrange a situation correctly, we can use their natural tendency to reenact adult behavior as a "read out" of how they understand the world. Such an approach has been extensively used in the psycholinguistic literature to assess children's linguistic structure. This work shows that children who are asked to imitate a sentence of the adult language tend to respond with a similar sentence, often synonymous with the to-be-imitated one, but which conforms to the child's own linguistic rules. The behavioral reenactment procedure uses the imitation of goal-directed acts to examine the psychological structures children use in interpreting human behavior.

A third set of techniques capitalizes on children's very early tendency to read meaning into human emotional expressions. This underlies early "social referencing" studies but also has been developed in a more sophisticated way by Repacholi (Repacholi, 1998; Repacholi & Gopnik, 1997). There is evidence that basic emotions such as happiness, sadness, and disgust are associated with particular facial expressions from early infancy and universally across cultures (e.g., Darwin, 1872; Ekman, 1980). Emotions are closely and intricately connected to intentions and desires in our adult understanding of mind. In the everyday adult framework, we assume that getting what we want or acting as we intend to will lead to happy emotions, whereas failure will lead to negative emotions. We also assume that we act in a way that will bring about positive but not negative emotions. Some of the new techniques we discuss in this chapter exploit the early nonverbal ability to read emotional expressions as a way of investigating children's understanding of the mind.

Taken together, these recent procedural advances in addressing questions to very young children are starting to reveal some of what children understand in the dark ages. There are two important foci of children's developing understanding of the mind in this period. One is their understanding of perception and attention (e.g., Baldwin, 1993a, 1993b; Gopnik, Slaughter, & Meltzoff, 1994; Gopnik & Wellman, 1994; O'Neill, 1996; Slaughter & Gopnik, 1996; Tomasello, 1995). The other is an understanding

of what Searle (1983) called "world-to-mind states" such as desire and intention. We focus on the latter in the present chapter.

UNDERSTANDING DIRECTEDNESS

In full-fledged adult psychology, an important feature of desires and intentions is that they are "directed at" objects and events. In fact, in adult psychology this is one thing that distinguishes desires and intentions from mere moods, feelings, or emotions and makes them similar to perceptions and beliefs. At the same time, desires, intentions, and emotions, unlike perceptions and beliefs, share what we might call valence. Desires carry with them an implication of certain positive or negative attitudes towards objects and events. Getting what we want is good, and being frustrated is bad. Doing what we intend to do is good, failing to do so is bad.

A Conceptual Clarification: Intention and Intentionality

What we are calling the "directedness" of these states sometimes is referred to in psychology as the "intentional" character of desire and intention, but this derives from a misunderstanding (or loose adaptation) of a technical philosophical term. *Intention* in the technical philosophical sense refers to the propositional character of a mental state, not solely the fact that it is directed at objects in the world. This is an important distinction inasmuch as some mental states may be directly or causally related to real objects or events in the world, without being intentional. The classical philosophical example is "seeing" (as opposed to "believing" or "seeing that"). This mental state is related to real objects and events in the world, not to mental representations of events, and this has important consequences. I can substitute different descriptions of the same event and preserve the truth of the sentence when "see" is used in the nonintentional sense. For example, it is true to say that someone sees the author of *Waverley* when they see Scott, but it is not true to say that someone, who believes this person is Scott, also believes that he is the author of *Waverley*. The same holds for world-to-mind states such as wanting and intending. These states may simply be directed at objects or events, which means that descriptions can be substituted preserving truth, or they may be genuinely intentional (in the technical, philosophical sense), which means that they cannot.

The terminological distinction is important for developmental psychologists because it lets us discriminate between two different ways young children might understand the "aboutness" or "directedness" of mental states. It also should prevent us from assuming that if a child has the minimal idea of the directedness of mental states, they must also have an under-