

# The Developing Mind

Stephen A. Butterfill  
<s.butterfill@warwick.ac.uk>

## 1. From Myths to Mechanisms

How do humans come to know about—and to knowingly manipulate—objects, causes, words, numbers, colours, actions and thoughts? In a beautiful myth, Plato suggests that the answer is recollection. Before birth, in another world, we become acquainted with the truth. Then, in falling to earth, we forget everything. But as we grow we are sometimes able to recall part of what we once knew. So it is by recollection that humans come to know about objects, causes, numbers and everything else.

How else could this happen? Since Plato philosophers and psychologists have offered other stories. Some hold, like Plato, that knowledge is in some sense present at birth. Or else that the concepts which make knowledge possible are already present at birth. Others suggest that concepts and knowledge are acquired through sensory experience, through learning to act, through training in language or through social interaction. These are seductive ideas but none has survived rigorous scientific testing; some have failed, others have yet to be thoroughly tested or are perhaps not currently precise enough test. And when we look at particular cases in detail—for instance, when we look at how humans come to know about colours—we will discover complexities that seem to be incompatible with any of the stories. That's why this book doesn't tour nativism, empiricism and other myths about the developmental origins of human knowledge, valuable though these are. Development is like climate change in one respect. Lots of different mechanisms are simultaneously at work and many interact with each other. To make progress we need to identify various mechanisms and attempt to model their interactions.

In broad outline, then, understanding the developmental origins of knowledge calls detailed investigation of many interacting but separate phenomena rather than large-scale theory building. This attitude is nicely captured by some psychologists reflecting on difficulties in understanding knowledge of objects:

‘there are many separable systems of mental representations ... and thus many different kinds of knowledge. ... the task ... is to contribute to the enterprise of finding the distinct systems of mental representation and to understand their development and integration’ (Hood et al. 2000, p. 1522).

Performing this task requires philosophical as well as more narrowly psychological investigation. The question is how humans come to know about objects, words, thoughts and other things. In pursuing this question we have to consider minds where the knowledge is neither clearly present nor obviously absent. This is challenging because both commonsense and theoretical tools for describing minds are generally designed for characterising fully developed adults. Davidson writes:

‘We have many vocabularies for describing nature when we regard it as mindless, and we have a mentalistic vocabulary for describing thought and intentional action; what we lack is a way of describing what is in between’ (Davidson 1999, p. 11).

This is why philosophy is needed. To understand the emergence of knowledge we need to find ways of describing what is in between: individuals whose movements are neither mindless nor guided by intention and knowledge.

This difficulty emerges in a concrete way in developmental research. When can infants first know things about objects they aren’t perceiving? For instance, when a ball falling behind a chair disappears from view, when do infants first realise that the ball is somewhere behind the chair? The ability to realise this is known as ‘object permanence’. One way to test for object permanence is to ask when infants first reach for objects they can’t see or when they first remove barriers to retrieve objects concealed behind them. Infants don’t do this until around eight months (Meltzoff & Moore 1998, p. 202) or maybe later (Moore & Meltzoff 2008). Since four-month-olds already have the planning skills they would need to execute the reach (Shinskey & Munakata 2001), their failure to reach is evidence that infants can first think about objects they aren’t perceiving at around eight months or later. But another way to test for object permanence is to ask how infants respond to apparently impossible events. Suppose, for example, that infants watch as a solid object is placed immediately behind a screen and then the screen falls backwards, ending up flat as though the object were not there, which is apparently impossible (Baillargeon et al. 1985; Baillargeon 1987). If infants show heightened interest in this and similar cases, perhaps by looking at the display for longer than might otherwise be expected, this would be evidence that they can know things about objects they aren’t perceiving.<sup>1</sup> As it

---

<sup>1</sup> These particular studies have been attacked on methodological grounds (e.g. Sirois &

turns out, infants show such heightened interest from around four months or earlier. Put together, the two sorts of findings give rise to the ‘paradox of early permanence’ (as Meltzoff & Moore 1998 call it). The best explanation of the first sort of findings seems to be that infants cannot think about objects they aren’t perceiving until eight months or later; but the best explanation of the second sort of findings seems to be that infants can do this from around four months or earlier. Clearly these explanations cannot both be correct. But neither seems to be wrong. Resolving this apparent conflict requires responding to an instance of Davidson’s challenge and find ways of describing phenomena in between mindless ignorance of unseen objects and adult-like knowledge of objects.

In what follows we will repeatedly encounter instances of this challenge in considering the developmental origins of different domains of knowledge, and we will examine tools philosophers and psychologists have invented in responding to different instances of the challenge. Puzzling, often apparently contradictory patterns of findings concerning how humans come to know about things such as objects, colours, causes, numbers and the rest matter for two reasons. One is that they can advance our understanding of the origins of knowledge. The other is that they show how little is actually understood and how much is yet to be discovered. In what follows there is no much by way of answers; the primary aim is just to identify the puzzles.

## 2. The puzzle

Plan:

- Simple theory of the mind
- When can infants first represent objects they can’t see
- Generalisation
- Preview of cases
- Preview of remedies

## 3. Quotes

(Fodor 1975, p. 198): “the fundamental explicandum, is the organism and its propositional attitudes: what it believes, what it learns, what it wants and fears, what it perceives to be the case. Cognitive psychologists accept ... the facticity of ascriptions of propositional attitudes to organisms and the consequent necessity of explaining how organisms come to have the attitudes to propositions that they do.”

---

Jackson 2007), but there are other, related studies (some are mentioned by Aguiar & Baillargeon 2002).

(Locke 1689, p. 104): "... 'tis past doubt, that Men have in their Minds several Ideas, such as are those expressed by the words, Whiteness, Hardness, Sweetness, Thinking, Motion, Man, Elephant, Army, Drunkenness, ... and others: It is in the first place to be enquired, How he comes by them?"

(Dewey 1938, p. 12): "How does it come about that the development of organic behavior into controlled inquiry brings about the differentiation and cooperation of observational and conceptual operations?"

## 4. Why

Why study philosophy of mind and developmental psychology together?

'Naturalism in philosophy ... has the goal of articulating the application conditions of puzzling concepts (like knowledge and perception) so that empirical (scientific) methods can be used to answer questions ... Naturalism in epistemology is merely the attempt to get clear enough about what we mean when we talk about knowledge and perception to be able to tell—in ways a biologist or an experimental psychologist would recognise as scientifically respectable—whether what we are saying is true or not' (Dretske 2000, p. x)

## References

- Aguiar, A. & Baillargeon, R. (2002). Developments in young infants' reasoning about occluded objects. *Cognitive Psychology*, 45, 267–336.
- Baillargeon, R. (1987). Object permanence in 3.5- and 4.5-month-old infants. *Developmental psychology*, 23(5), 655.
- Baillargeon, R., Spelke, E. S., & Wasserman, S. (1985). Object permanence in five-month-old infants. *Cognition*, 20(3), 191–208.
- Davidson, D. (1999). The emergence of thought. *Erkenntnis*, 51, 7–17.
- Dewey, J. (1938). *Logic: The Theory of Inquiry*. New York: Henry Holt.
- Dretske, F. (2000). *Perception, Knowledge and Belief*. Cambridge: Cambridge University Press.
- Fodor, J. (1975). *The Language of Thought*. New York: Harvard University Press.

- Hood, B., Carey, S., & Prasada, S. (2000). Predicting the outcomes of physical events: Two-year-olds fail to reveal knowledge of solidity and support. *Child Development*, 71(6), 1540–1554.
- Locke, J. (1975 [1689]). *An Essay Concerning Human Understanding*. Oxford: Oxford University Press.
- Meltzoff, A. & Moore, M. K. (1998). Object representation, identity, and the paradox of early permanence: Steps toward a new framework. *Infant Behavior and Development*, 21(2), 201–235.
- Moore, M. K. & Meltzoff, A. N. (2008). Factors affecting infants' manual search for occluded objects and the genesis of object permanence. *Infant Behavior and Development*, 31(2), 168–180.
- Moore, M. K. & Meltzoff, A. N. (2010). Numerical identity and the development of object permanence. In S. P. Johnson (Ed.), *Neoconstructivism: The new science of cognitive development* (pp. 61–83). Oxford: Oxford University Press.
- Shinskey, J. & Munakata, Y. (2001). Detecting transparent barriers: clear evidence against the means-end deficit account of search failures. *Infancy*, 2(3), 395–404.
- Sirois, S. & Jackson, I. (2007). Social cognition in infancy: A critical review of research on higher order abilities. *European Journal of Developmental Psychology*, 4(1), 46.