Glossary

agent An agent of an action is a person or other individual who performs that action. When Ayesha kicks the door, she is the agent of the kick. 128, 136, 138–140, 216, 220, 230–232, 236, 294

altercentric interference The unintentional or nonpurposive influence of another's belief (or other mental states) on your own belief (or corresponding mental states). 168

Assumption of Representational Connections The assumption that the transition from early-developing forms of representation to belief or knowledge involves operations on the early-developing forms of representation which transform their contents into (components of) the contents of knowledge states. The Assumption of Representational Connections is implicitly required by many theories about the developmental emergence of knowledge, but not by the view that development is rediscovery. 93, 122, 288

A-task Any false belief task that typically developing children tend to fail until around three to five years of age. 174, 189, 204, 208, 210

automatic In this book, a process is *automatic* just if whether or not it occurs is to a significant extent independent of your current task, motivations and intentions. To say that *mindreading is automatic* is to say that it involves only automatic processes. The term 'automatic' has been used in a variety of ways by other authors: see Moors (2014, p. 22) for a one-page overview, Moors and De Houwer (2006) for a detailed theoretical review, or Bargh (1992) for a classic and very readable introduction. 109, 114, 190

block–slab model The block–slab model is a model of communication on which each word or gesture has a fixed use or fixed set of uses. 244, 246, 247, 249, 251, 252, 259

canonical model of minds and actions A model specified by a canonical theory of the mental. 197, 200, 202–204, 206, 210

canonical theory of the mental A theory of the mental which features attitudes like belief, desire, knowledge and intention and relies on a system of propositions to distinguish their contents. 195, 294

categorical colour property A property like *red* or *blue* which can be common to things that are different shades of colour. For example, Ayesha's crimson scarf and and Beatrice's scarlet jumper are both red. 98, 294

categorical perception of colour The process or processes by which humans (and perhaps other animals) detect categorical colour properties like red and blue. 103, 108, 114

CLSTX Conjecture Five-month-olds' abilities to segment objects, to represent them while briefly unperceived and to track their causal interactions are not grounded on belief or knowledge: instead they are consequences of the operations of a system of object indexes (Carey and Xu 2001; Leslie et al. 1998; Scholl 2007; Scholl and Leslie 1999). 73–76, 78, 80, 81, 93, 298

collective goal A *collective goal* is any outcome to which the actions of two or more agents are collectively directed. And for their actions to be collectively directed to an outcome is for their actions to be directed to an outcome where this is not, or not only, a matter of each action being individually directed to that outcome. 231, 235, 236

communicative intention A communicative intention is an intention to communicate, as opposed to an intention to achieve some extra-communicative end (such as getting you to pass me the salt). 247, 248, 258–260, 268

computational description A computational description of a system or ability specifies what the thing is for and how it achieves this. Marr (1982) distinguishes the computational description of a system from representations and algorithms and its hardware implementation. 142, 145, 146, 150, 247, 301

Conjecture O Five-month-olds' abilities to segment objects, to represent them while briefly unperceived and to track their causal interactions are not grounded on belief or knowledge: instead they are consequences of the operations of a system of object indexes … and of a further, independent capacity to track physical objects which involves motor representations and processes. 80–86, 91, 93, 94, 298

contrast case A contrast case is a pair of events which are as similar as possible except that one is a joint action while the other is not. 215

convention A convention is an arbitrary regularity to which everyone is known to conform, where this universal conformity provides everyone with a reason for conforming to it (see further Lewis 1969). 273, 275

core knowledge For an individual to have core knowledge concerning a domain such as physical objects, colour, number or minds is for her to have a core system specifically for this domain. For someone to have core knowledge of a particular principle or fact is for her to have a core system where either the core system includes a representation of that principle or else the principle plays a special role in describing the core system. Core knowledge is not knowledge, and you can have core knowledge of things that are untrue (for this reason Carey (2009, p. 10) recommends the term 'core cognition' for states of core knowledge). 7, 8, 56, 58–61, 63, 65, 93, 108, 114, 115, 151, 190, 213, 233, 287, 291, 295

Core Knowledge View According to this view, the Principles of Object Perception are not things infants know but rather encoded in their core knowledge. The operations of core system enables this core knowledge, together with perceptual inputs, to generate expectations concerning particular physical objects. And these expectations are not knowledge states but representations in core systems. 57–60, 63

core system This book uses a nonstandard, minimally informative notion of core system on which a 'core system' for a particular domain is simply whatever it is that underpins the earliest abilities infants manifest in that domain (see section 5.5). However, core systems are standardly identified by giving a list of features. The lists vary between researchers and times. Carey and Spelke (1996, p. 520) assert that core systems are largely innate, informationally encapsulated (that is, their operations are largely unaffected by things you know or believe, and by core knowledge in other core systems), largely unchanging over the course of development (so adults and infants alike have the same core systems). They also say that the inputs to core systems are the outputs of perceptual systems, so that architecturally core systems in human adults occupy a position between perception and knowledge. Finally, core systems are also held to arise from systems already present in the evolutionary ancestors of modern humans. Carey (2009) adds that the representations in core systems are iconic representations. 7, 57, 59, 60, 63, 174, 209, 295

descriptively adequate Some principles are descriptively adequate for characterising a person's ability just if they enable us to predict the extent and limits of that person's ability. Contrasts with formally adequate and explanatorily adequate (see table 2.2 on page 40). 24, 38, 50, 60, 82, 278, 296

dishabituation See habituation. 18, 27, 29, 35, 59, 115, 128, 134, 151

dual process theory of mindreading A theory on which mindreading involves two or more processes which are distinct in this sense: the conditions which influence whether one mindreading process occurs differ from the conditions which influence whether another occurs. (For background on dual process theories in social cognition generally, Sherman, Gawronski and Trope (2014) is an excellent collection of essays.) 192, 203

explanatorily adequate For some principles to be explanatorily adequate for characterising a person's ability is for there to be a link between the principles and her mind in virtue which she has this ability. Where such a link exists, the principles do not merely describe her ability. Instead they play a role in specifying the nature of processes, representations or systems underpinning it as, for instance, when the principles specify the contents of knowledge states on which the ability is based. Contrasts with formally adequate and descriptively adequate (see table 2.2 on page 40). 24, 39, 60, 278, 284, 290, 296

extra-communicative intention Any intention that might in principle be achieved without communication at all. 247

extra-communicative purpose Any purpose that might in principle be achieved without communication at all 245, 246, 253, 257, 259, 275

formally adequate Some principles are formally adequate for characterising an ability to the extent that someone who took the principles to be true, was otherwise omniscient and had unlimited cognitive resources could use the principles to manifest the ability. Contrasts with descriptively adequate and explanatorily adequate (see table 2.2 on page 40). 38, 73, 278, 296

goal (of an action) A *goal* of an action is an outcome to which it is directed. 127

Gricean model On the Gricean model of communication, to produce a communicative action involves acting with an intention to provide someone with evidence of an intention with the further intention of thereby fulfilling that intention. And to comprehend a communicative action is to know that the communicator has such intentions. 250, 251, 259

habituation Habituation is used to test hypotheses about which events are interestingly different to an infant. In a habituation experiment, infants are shown an event repeatedly until it no longer holds their interest, as measured by how long they look at it. The infants are then divided into two (or more) groups and each group is shown a new event. How much longer do they look at the new event than at the most recent presentation of the old event? This difference in looking times indicates *dishabituation*, or the reawakening of interest. Given the assumption that greater dishabituation indicates that the old and new events are more interestingly different to the infant, evidence from patterns of dishabituation can sometimes support conclusions about patterns in how similar and different events are to infants. 13, 18, 42, 46, 82, 86, 91, 111, 296

homesign A language created by a child with no experience of others' languages. 269, 272, 274, 287

iconic representation A representation is iconic if parts of the representation represent parts of the thing represented. Pictures are paradigm examples of iconic representations. For example in a picture of a flower, some parts of the picture may represent petals while others represent the stem. 59, 295

independent processes Two kinds of process are independent just if the conditions which influence whether a process of one kind will yield an incorrect response differ to some extent from the conditions that influence whether a process of the other kind will yield an incorrect response. 192, 203, 209

inferential integration For states to be *inferentially integrated* means that: (a) they can come to be nonaccidentally related in ways that are approximately rational thanks to processes of inference and practical reasoning; and (b) in the absence of obstacles such as time pressure, distraction, motivations to be irrational, self-deception or exhaustion, approximately rational harmony will characteristically be maintained among those states that are currently active. 4

innate Not learned. While everyone disagrees about what innateness is (see Samuels 2004), in this book a cognitive ability is innate just if its developmental emergence is not a direct consequence of data-driven learning. 281, 287, 295, 300

intentional isolation Two representations are *intentionally isolated* when the only links between them, if any, are provided by intentional isolators. 10

intentional isolator An event or state which links representations but either lacks intentional features entirely or else has intentional features that are only very distantly related to those of the two representations it links. Metacognitive feelings and behaviours are paradigm intentional isolators. 9, 94, 95, 298

Joint Action Conjecture Abilities to perform joint actions play a role in explaining the developmental emergence of knowledge, including knowledge of others' minds and words. 214, 218–220, 229, 235, 237

knowledge proper Knowledge proper (or 'knowledge' for short) is constitutively linked to practical reasoning and to inference. Knowledge is the kind of thing that can typically influence how you act when you act purposively, and it is the kind of thing that can influence purposive actions in any domain at all. Knowledge is also the kind of thing that you can sometimes arrive at by inference, and which can enable you to make new inferences in any domain at all. A state that is not linked to practical reasoning and to inference in these ways is not knowledge. 4, 8

lexical acquisition The process of acquiring words, especially (in this book) your very first words. (Why not use the less technical-sounding term 'word learning'? Because lexical acquisition is often not a matter of learning but of lexical innovation.) 263, 266, 275

lexical innovation The creation and creative misuse of words. 266, 298

Linking Problem The problem of explaining what links the Principles of Object Perception to the abilities in virtue of which infants (and others) are able to segment objects, represent them as persisting and track their casual interactions (see section 3.4). The Simple View, the CLSTX Conjecture and Conjecture O are competing attempts to solve it. 39, 41, 50–52, 54, 56, 58, 60–65, 73, 82, 83

Marr's three levels Marr (1982, pp. 22ff) distinguished three things a theory of a cognitive system should provide. The *computational description* specifies what the system is for and what it does in the broadest terms. Fixing *representations and algorithms* specifies how the system represents its inputs and outputs as well as how it transforms one into the other. Finally, to describe the *hardware implementation* is to specify how the representations and algorithms are physically realised. 204

metacognitive feeling Paradigm examples of metacognitive feelings include the feeling of familiarity, the feeling that something is on the tip of your tongue, the feeling of confidence and the feeling that someone's eyes are boring into your back. In this book, I propose that one characteristic of metacogntive feelings is that either they lack intentional objects altogether, or else what their subjects take them to be about is typically only very distantly related to their intentional objects. (This is controversial—see Dokic 2012 for a variety of conflicting theories.) 72, 84, 85, 88, 94, 115, 298, 301

minimal model of minds and actions A model specified by a minimal theory of mind. 200, 204, 206, 207

minimal theory of mind A theory of the mental in which: (a) mental states are assigned functional roles that can be readily codified; and, (b), the contents of mental states can be distinguished by things which, like locations, shapes and colours, can be held in mind using some kind of quality space or feature map. 198, 200

model of communication A model of communication is a way communication could be. 247

model of the mental A model of the mental is a way mental aspects of the world could be. A model is not a theory, although it may be specified by one. 195

motor representation The kind of representation characteristically involved in preparing, performing and monitoring sequences of small actions such as grasping, transporting and placing an object. They representat actual, possible, imagined or observed actions and their effects.

5, 51, 52, 79–81, 143, 144, 146

Motor Theory of Goal Tracking Tracking goals is acting in reverse (see section 7.8 and Sinigaglia and Butterfill 2016). 144, 146–150, 154

non-A-task Any false belief task that typically developing children tend to pass in their first or second year of life. 174, 189, 205, 208

object index An object index is a mental pointer to an object; it is the mental counterpart of the finger you might use to keep track of a moving object by pointing at it and following its path with your finger. See further Scholl (2001, pp. 27ff). 65, 78–81, 85, 86, 93

object-specific preview benefit When a feature (for example, the letter 'T') presented earlier reappears now, how long will it take people to confirm that they saw this feature earlier? All other things being equal, people are mostly faster when the feature reappears on the same object than when it reappears on a different object. This difference in response times is the object-specific preview benefit (Kahneman, Treisman and Gibbs 1992). 67

oddball effect Suppose you see a series of things that are all the same; and then, unpredictably, you see something different. An oddball effect occurs when your brain responds differently to the different thing. 109, 110, 112, 113

perceptual animacy The detection by broadly perceptual processes of animate objects (Scholl and Gao 2013, pp. 201–2). 152

pop out Suppose a set of distractors and a target are presented simultaneously. The target is said to pop out when the number of distractors makes no significant difference to the time it takes to find the target (see further Treisman 1986, p. 117). 104, 106–113, 122

poverty of stimulus argument An argument used to establish that something is innate. A poverty of stimulus argument aims to establish that something humans acquire is not acquired by data driven-learning (see Pullum and Scholz 2002). 281, 283, 284, 287, 289

poverty of theory argument An inexpensive alternative to a poverty of stimulus argument. 285

Principles of Object Perception Principles which characterise how physical objects are perceived. These are thought to include no action at a distance, rigidity, boundedness and cohesion. See table 2.1 on page 38 for a brief statement of these principles. 24, 25, 28, 33, 36–38, 41, 50–52, 56, 58, 60, 70, 72, 73, 82, 83, 92, 284, 295, 298, 302

propositional communication Contrast remarking on an event by saying 'Ouch!' with remarking on it by saying 'That looks painful.' Both involve reference to an event, but only the second case involves propositional communication. 277

pure goal tracking Tracking goals is pure when does not involve ascribing intentions or any other mental states. 137, 146, 149

purposively communicative Contrast accidentally letting a yawn escape you, thereby communicating your boredom, with deliberately yawning in order to communicate. When communicating is among the goals to which an action is directed, it is purposively communicative. 240, 275

rediscovery Rediscovery occurs when principles related to those already implicit in early-developing capacities to engage with physical objects, colours, mental states or some other domain must be discovered anew. Where there is rediscovery, there are no direct representational connections between the early-developing abilities and the beliefs or knowledge which emerge. Instead the early-developing abilities influence behaviour, guide attention and give rise to metacognitive feelings. 9, 123, 288, 289

referential communication Contrast yawning with pointing: only the latter involves reference to an object or event. Nonreferential communication involves a communicator and an addressee; referential communication additionally involves an object or event which is the topic of communication. 240, 275

representations and algorithms To specify the representations and algorithms involved in a system is to specify how the inputs and outputs are represented and how the transformation from input to output is accomplished. Marr (1982) distinguishes the representations and algorithms from the computational description of a system and its hardware implementation. 142, 145, 146, 150, 294

shipwreck survivor theory A type of theory about how children acquire their first words. On any such theory, the task of acquiring words is achieved by formulating and testing hypotheses about what words mean. The theory has a long history; Bloom (2000) offers a recent, detailed version. 268, 272–275

signature limit A signature limit of a system is a pattern of behaviour the system exhibits which is both defective given what the system is for

and peculiar to that system. A signature limit of a model is a set of predictions derivable from the model which are incorrect, and which are not predictions of other models under consideration. 65, 74, 83, 154, 200

Simple View This term is used for two thematically related claims. Concerning physical objects, the Simple View is the claim that the Principles of Object Perception are things we know or believe, and we generate expectations from these principles by a process of inference. Concerning the goals of actions, the Simple View is the claim that the principles comprising the Teleological Stance are things we know or believe, and we are able to track goals by making inferences from these principles. 13, 25, 34, 37, 39, 41, 49, 51, 52, 54, 58, 63, 65, 73, 76, 78, 82–86, 142, 145–147, 149, 150, 278, 290, 291, 298

the Mindreading Puzzle The puzzle is to determine which of these three collectively inconsistent claims are false. For many children, there is an age at which:

1. in performing false belief tasks which are A-tasks, the child relies on a model of minds and actions not incorporating beliefs;
2. in performing false belief tasks which are not A-tasks, such as tasks involving anticipatory looking or violation-of-expectation, the child relies on a model of minds and actions incorporating beliefs; and
3. the child has a single model of minds and actions.

167, 168, 173, 176–179, 183, 184, 186, 187, 189, 207

The Teleological Stance To adopt the Teleological Stance is to exploit certain principles concerning the optimality of goal-directed actions in tracking goals (for details see section 7.5 on page 138). 138, 153, 154, 253, 254

track a belief For a process to track someone's belief that p is for it to nonaccidentally depend in some way on whether she believes that p. For someone to track beliefs is for there to be processes in her which track some beliefs. 167

track a goal For a process to track a goal of an action is for how that process unfolds to nonaccidentally depend in some way on whether that outcome is indeed a goal of the action. For someone to track the goals

of an action is for there to be processes in her which track one or more goals of that action. 127, 142, 150, 302

track syntactic properties For a process to track syntactic properties is for how it unfolds it to nonaccidentally depend in some way on the syntactic properties of things. To say that someone can track syntactic properties is to say that there is processes in her which tracks some syntactic properties. 278, 281

training theory A type of theory about how children acquire their first words. On any such theory, a child acquiring her first words is like a pigeon learning to peck in response to target appearing. 263, 266, 273, 275

violation-of-expectation Violation-of-expectation experiments test hypotheses about what infants expect by comparing their responses to two events. The responses compared are usually looking durations. Looking durations are linked to infants' expectations by the assumption that, all things being equal, infants will typically look longer at something which violates an expectation of theirs than something which does not. Accordingly, with careful controls, it is sometimes possible to draw conclusions about infants' expectations from evidence that they generally look longer at one event than another. 13, 16, 42, 46, 48, 78, 82, 83, 85, 86, 91, 162, 170, 183

visual search task In a typical visual search task, you are shown an array of items simultaneously and tasked with finding one that meets a certain criterion. For example, you may be tasked with finding the odd one out, or with finding the face. 113