In our everyday social lives we routinely understand the behaviour of others by attributing mental states to them. This book is the first to draw together from a range of disciplines research into the origins and emergence of this fundamental and astounding ability—the use of a natural 'theory of mind'.... In developmental psychology researchers have begun to trace the child's developing understanding of such concepts as desires, emotional states and intentions. Ethologists and comparative psychologists have asked how and why an ability to read the mind of another might emerge in the course of evolution. In computer science, the question is how to shape the emergence within computational systems of representations of the minds of others, be it to copy their expertise or to interact with users in a more 'human' fashion.... This volume brings together contributions from these three disciplines, with others from philosophy and anthropology, on the central topic of the emergence of theories of mind. The interdisciplinary cross-talk it initiates ranges from the conceptual and methodological foundations to exploration of common patterns in machine, animal and man.

Contents

List of contributors

1. Fundamental issues in the multidisciplinary study of mindreading. Andrew Whiten and Josef Perner
2. From desires to beliefs: Acquisition of a theory of mind. Henry M. Wellman
3. Developing understanding of desire and intention. Janet W. Astington and Alison Gopnik
4. Understanding others: Evidence from naturalistic studies of children. Judy Dunn
6. From agency to intention: A rule-based, computational approach. Thomas R. Schultz
8. Planning and plan recognition from a computational point of view. Charles F. Schmidt and Stacy C. Marsella
9. Computation and mindreading in primate tactical deception. Richard W. Byrne and Andrew Whiten
10. Playing with others' expectations: Teasing and mucking about in the first year. Vansudevi Reddy
12. Reading minds or reading behaviour? Tests for a theory of mind in monkeys. Dorothy L. Cheney and Robert M. Seyfarth
13. Visual behaviour as a window for reading the mind of others in primates. Juan C. Gomez
15. The ontogeny and phylogeny of joint visual attention. George Butterworth
16. Precursors to a theory of mind: Understanding attention in others. Simon Baron-Cohen
17. Perceptual origins and conceptual evidence for theory of mind in apes and children. David Premack and Verena Dasser
18. The emergence of metarepresentation in human ontogeny and primate phylogeny. Andrew Whiten and Richard W. Byrne
19. The work of the imagination. Paul L. Harris
20. Narrativity: Mindreading and making societies. Michael Carrithers
21. The emergence of mindreading: Steps towards an interdisciplinary enterprise. Andrew Whiten

References

Index
Abstract: (summarized) Discusses the development of the understanding of belief, desire, and intention in childhood. (from the chapter) distinguishing desires and outcomes; representational nature of desire.

Abstract: (from the chapter) make inferences about children's mindreading abilities from naturalistic observations; our strategy has been to examine a broad range of aspects of children's behaviour and conversation, with different partners and in different emotional settings: their disputes and arguments, their empathetic and cooperative behaviour, their discussion of other people, their fantasy play and jokes, their response to the interactions between others... the evidence from these different aspects of children's behavior, drawn chiefly from three longitudinal studies of children at home with their mothers and siblings, has been brought together and discussed in a recent book entitled “The Beginnings of Social Understanding” (Dunn, 1988)... this chapter will focus on the implications of that evidence, and of further data drawn from an ongoing study in the US, for two important issues relevant to the themes of this book; the first issue is the nature of very young children's understanding of psychological states in others, and the second is the issue of what contexts and processes are involved in the development of that understanding.

Abstract: (from the chapter) there are three broad possibilities for explaining autism; (1) there is a basic affective disorder which somehow produces the other impairments in cognition and surface behaviour; (2) there are two independent basic disorders in autism, one affective, the other cognitive, which jointly produce the surface impairments; (3) there is a basic cognitive deficit in high-ability autism which produces the secondary consequences, including affective disorder and impairment in social and communicative behaviour; it is this last possibility that I want to argue for.

Abstract: (from the chapter) explore a rule-based computational approach to a particular problem in ETM (early theories of mind), the concept of agency, then proceed to describe the current model of agency, and finally turn to a discussion of related issues such as transition mechanisms, concepts related agency and continuity in development... the concept of agency explains that a being moves or behaves on its own, without the influence of external causation.

Abstract: (from the chapter) described a procedure for deciding what mental content to attribute to an animal... the economy rule as advice; empirically equivalent results; thoughts about thoughts: preliminary tidying; desires to produce thoughts: a dilemma.

Abstract: (from the chapter) the possession of a symbol system is required in order to achieve the full semantics that are typically associated with the capacity to represent beliefs and goals; in order to explicate the sense in which this statement is true, we will focus on the possible role of such representations in the various models of planning and plan recognition that have been developed within AI (artificial intelligence).

Abstract: (from the chapter) our initial survey of tactical deception in primates (Whiten and Byrne, 1988a), we emphasized the implications for primate psychology of obtaining good evidence which implied an understanding of others' intentions (and those of deception) by the animal; we then attempted to say what would convince us to accept an explanation, and evaluated—usually in the negative—the evidence available at the time; we now have a much greater corpus of data available against which to test the preliminary conclusions made at that time, and to do so is the purpose of this chapter.


Abstract: (from the chapter) most psychological research on teasing has looked at the very negative effects which teasing can have; the more positive forms of teasing have occasionally been mentioned in the psychological literature ...but have never been systematically, or even directly, studied: I believe it is an important mode of interaction for three reasons, of which I shall in this paper be discussing the latter two; for its effects on relationships; for what it shows about the understanding of others' minds; for its links with deception and pretence... infants' engagement with others' intentions and expectations; physical and psychological explanation in understanding others; pretending.


Abstract: (from the chapter) look at two verbal forms of teasing and deception; jokes and lies; my aim is to show how children's understanding of falsehood is related to their developing understanding of people's intentions and beliefs... focus primarily on the child's understanding of jokes and lies because the distinction between these two acts seems to rely on distinguishing the higher-order intentions and beliefs (i.e. what A wants B to believe).


Abstract: (from the chapter) describe two experiments designed to investigate the ability of monkeys to attribute mental states to others and to distinguish between their own knowledge and the knowledge of others... the first experiment examines the issue of informing, and considers whether individuals take into account their audiences state of mind when alerting them to the presence of food or danger; do signallers recognize ignorance in their audience, and, if so, do they make any special effort to alert ignorant individuals more than knowledgable ones... the second experiment considers the extent to which a monkey's behaviour is influenced by her audience's apparent presence, as opposed to her audiences knowledge; do monkeys take into account theory of visual perspective when monitoring one another, or do they recognize that another individual's perspective, and hence the knowledge derived from it, can differ from their own.


Abstract: (from the chapter) present some data on the development of eye-contact patterns in an infant gorilla interacting with human adults in problem-solving situations; the subject of this longitudinal study was a hand-reared female infant gorilla ...observed in a zoo nursery environment from about six months to 30 months.


Abstract: (from the chapter) review my evidence suggesting that plovers exhibit purposeful behaviour; field studies were undertaken to investigate the plovers' use of 'injury feigning' or broken wing displays; 'injury feigning' is among the most intense of a repertoire of anti-predator behaviours... deception; attentiveness to the gaze of another.


Abstract: (from the chapter) detailed information on the communicative function of gaze is most readily obtained in controlled experiments with human infants and this paper will briefly review a series of studies carried out in our laboratories; the first series to be discussed is specifically concerned with the comprehension of gaze; secondly, results on the comprehension and production of manual pointing will be reviewed.

Abstract: (from the chapter) consider some new evidence of joint attention-deficits in autism, and explore the possibility that a critical precursor in the development of a theory of mind lies in the infants' understanding of attention in others.


Abstract: (from the chapter) theory of mind, like any other major competence, can be studied on both a perceptual and conceptual level, and we will provide examples of both levels in this paper; on the perceptual level one relies almost exclusively on habituation/dishabituation procedures... consider now the conceptual level on which we also study theory of mind; here we supplant habituation/dishabituation with higher-order measures involving judgment and choice... the infant's theory of self-propelled objects; the conceptual level: next versus relevant; experiment: next versus relevant; the chimpanzee's theory of mind: the current verdict.


Abstract: (from the chapter) in attempting ...deception, a child evidences two cognitive abilities which go beyond any primary representation of the world whose function is to represent perceived reality as faithfully as possible: the ability to pretend that something has happened which really has not; and an ability to model the mind of another human; we here suggest that a comparative, evolutionary approach to the same phenomena now supports and extends the idea that pretence and mindreading are part of a fundamental cognitive pattern... consider if pretence and mindreading in non-human primates fit this pattern.


Abstract: (from the chapter) recent work in developmental psychology has shown that young children explain and predict behaviour in terms of every-day mental concepts, notably beliefs and desires; from this evidence, some have concluded that children adopt a theory of mind; I shall argue instead that children engage in an increasingly sophisticated process of mental simulation that allows them to make quasi-theoretical predictions... mental simulation depends on the capacity to engage in two successive steps: (1) to imagine having a particular desire of belief, and (2) to imagine the actions, thoughts or emotions that would ensue if one were to have those desires or beliefs; the products of such a simulation can then be attributed to other people who do have the simulated desires or beliefs... my analysis incorporates the notion of role-taking ...but seeks to show how such a process might operate in early childhood; it provides a framework for interpreting two reasonably well-established facts: (1) the increasing accuracy with which children can diagnose mental states, and (2) the deficits shown by autistic children in making such diagnoses... the capacity for pretence; reasoning with pretend premises; altering default settings.


Abstract: (from the chapter) propose that we might usefully think of a distinct capacity, narrativity, a property of the human species which differentiates it from other species; mindreading or higher-order intentionality, I argue, is a necessary foundation for narrativity; it is narrativity which allows humans to grasp a longer past and a more intricately conceived future, as well as a more variegated social environment; narrativity supports the more elaborative and mutable sociality which differentiates humans from their cousins, the other social primates... My arguments therefore are phylogenetic and sociological rather than ontogenetic and psychological; if they are acceptable, however, they should also be able to be translated into a developmental perspective.
As suggested by the subtitle; Evolution, development and simulation of everyday mindreading, Whiten has brought together researchers involved in everything from ethological approaches to "mind - reading" in primates and birds, to those developing formal mathematical models of planning and plan recognition. This interdisciplinary approach, which also includes a chapter by Carrithers placing the development of a theory of mind within the broader context of sociology and anthropology, is at the same time both the strength of this volume and it's limitation.