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The search for mind. A new foundation for cognitive science
Sean O'Nuallain
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This book has several aims. First, it intends to be an introduction to cognitive science (CS). In this sense, its target reader would be a student who wants to know and understand the background of this field, or better of its specific subdisciplines. In fact, the author examines in detail the contribution that different disciplines offer to the general enterprise of CS: epistemology, cognitive psychology, linguistics, neuroscience, and artificial intelligence. Even ethnoscience and ethology (rarely mentioned in this context) are considered in some chapters. The book's introductory character is manifest as concepts are extensively explained, and there are glossaries for difficult terms.

At the same time, the book aims to be a discussion of how things stand in this field and a critical evaluation of how far CS has kept its promises. Furthermore, it makes some predictions on what CS is likely to be; it also makes proposals on what it should be. With so many different purposes, the author might easily run the risk that none would been fully accomplished.

However, in my opinion, the author has succeeded, although—of course—he could not cover all those aspects in equal depth. At first sight, one can say that the book is similar to a map or a guide for a touristic exploration into a field that, honestly, often appears confused. The author is very clever in tying up different strings hanging from different skeins and in giving insights on how to reach their roots. Of course, there also must be many parts of the book that are not easy and that probably cannot be read as a simple introductory text, inasmuch as one needs some knowledge and experience to fully appreciate all those brilliant reflections and allusions. The field of CS has many fundamental problems. As a consequence, the book also may be of interest to an advanced scholar who wants to go deep into concepts.

The book is divided into two parts, one treating "the constituent disciplines" of CS, the other proposing "a new foundation" for CS. The first part, which is better developed than the second, can be read as an excellent introduction to the main topics in CS subfields, but at the same time as a preparation for the proposals for a new foundation of CS. In fact, the author here starts drafting his own view, called the planian framework" (from John Nolan, an early author's pseudonym). In this framework, three aspects of mind (immanent, computational, and phenomenal) and three modes of cognition (egocentric, intersubjective, and autistic) are considered.

Different subdisciplines of CS are treated thoroughly. Philosophical epistemology focuses on how Occidental thought, starting from Greek philosophy, has faced the problem of knowledge.

In this route also, non-standard authors are mentioned, like Thomas Aquinas. One might ask why epistemology should be more relevant to the search for mind than philosophy of mind. In fact, the author does not endorse such a claim, but he does not hide his antipathy for a certain kind of philosophy where a priori argumentation prevails over demonstration. In part, it is only a question of what titles emphasize.

But if we were expecting O'Nuallain to put his cards on the table, he is not reluctant to declare that two philosophical places are available in the Nolanian framework. One is occupied by Kant, who achieved at his best the idea that sensory data somehow must be structured into categorical shapes. The other position is taken by Merleau-Ponty, who made us aware that cognition should not be considered as a "disembodied" soul.

In the part dealing with psychology, the author is even more explicit about the role of phenomenology and what he defines as the "mistake" of ignoring affect and social factors. To reach such a conclusion, he sketchily analyzes many contributions from different areas in psychology, ranging from perception to memory, to problem solving, to reasoning (oddly, references to work on concepts and categories are missing), and also such authors as Wertheimer, Freud, Gibson, Piaget, and many others. Of course, the role of perception may not be ignored, since it is the basis for cognition; development should also be taken into account, such as memory and learning. But to study mind, we must start from "the human organism immersed, embodied, in a life world". And to study problem solving (to mention but one topic) we must ask "why one sets problems for oneself", that is, consider affective and motivational aspects.

Linguistics is entered as a "minefield", given its "fractious" character (sometimes the book gives us the opportunity of learning unusual words). O'Nuallain examines issues of formal grammars and computational linguistics (with all that stuff like parsing, transition networks, etc.) only to convince us of two basic things: (1) studying language *per se* in cognition a vacuous exercise if the language – thought relation is not explored; (2) language, like all other behaviour, is situated and occurs in a *context.*

The chapter dealing with neuroscience covers methodology and gives an outline in neuroanatomy. The main part, however, focuses on neural networks and on Edelman's work. O'Nuallain (in my opinion, correctly) realizes that most of the PDP appeal is essentially in considering it as a theory of nonsymbolic activity or "tacit knowledge". Edelman's claim that neurobiological evidence exists to constrain cognitive psychology is rejected, but his general conclusions are accepted (e.g. the need for a biological ground in CS, the rebuttal of functionalism and of the computational metaphor). The overall lesson coming from neuroscience is that we must look at an active subject/body seeking fitness in the environment.

AI, for its part, seems to have almost nothing important to say to CS, in the author's opinion. So that a "30-second history" of AI (further reduced here) sounds like this: a group of excited young men wanted to build intelligent machines; they initially had some limited success with automated tasks in speech, vision, or reasoning. They got funding, but, as they became older and wiser (and—we can add—they wanted to extend their findings from toy worlds to the real world), they discovered that they had been misguided, and that only by becoming concerned with issues like knowledge representation could they regain some credibility. In fact, it seems curious in a chapter on AI to read names like Husserl and Bateson. As in all sections of this book, there is a moral: syntax is not enough, a system attached from the environment is not enough. A few pages on ethology and neuroscience follow to suggest that mind cannot be studied out of context, either environmental or socio-cultural.

As we have said, the book's second part, proposing a "new foundation" for CS, is shorter than the first. But the first part has laid the foundation for the development of arguments. The treatment of concepts like symbols, consciousness, and selfhood is the last demanding job in the book. The effort of the author is turned toward an integration of those concepts, so that conscious experiences are those that self identifies as non-alien". In the pleats of this discussion one can find much more, even free will and religion.

All the time the reader is reading the book, as with a thriller, he is told that the Nolanian framework will be fully revealed at the end. And as in any self-respecting thriller, we don't want to spoil the surprise but to stimulate others to read it. But for the most part it can be guessed from many (perhaps too many) things already disclosed.

This book is written in a brilliant and exciting style (sometimes difficult for a non-English

reader); it features many pictures, rather cartoons (to tell the truth, not always clear) inspired by Myles, an Irish comic writer. If we want to take stock of its merits and limits, its main merit is to draw the attention of cognitive scientists to non-standard issues in current CS, such as phenomenology, affect, and social factors. Perhaps a shortcoming of the book is to present itself both as an introduction and as a critique; as a consequence it is not always clear who is the audience. Eventually, it seems that, having pursued its noble aim of enriching CS by conducting it towards "mind", even though it realized that the "C" in CS is too narrow and limiting, it remains entangled in CS, and the author has not taken the bigger step, to go beyond CS, and to declare that a new science is needed.

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Mindblindness: an essay on autism and theory of mind

SIMON BARON-COHEN
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In this book, developmental psychologist Simon Baron-Cohen discusses recent findings indicating that children possess innate proclivities toward mentalistic interpretations of behavior. These discoveries may give pause to eliminativists eager to wager that scientific research will soon discredit folk psychology. And philosophers who fear that a primitive, misguided theory of behavior undergirds most philosophical reflection on human existence may want to seize upon the findings as evidence that Mother Nature encourages her children to become practicing folk psychologists.

Impressive research by Heinz Wimmer, Josef Perner, Baron-Cohen, and other psychologists has established that by the age of four most children can successfully deploy concepts of belief, desire, and other mental states in explaining and predicting behavior. This "mindreading" capability emerges spontaneously, with no need of instruction or superior intellectual endowments. Children with Down's syndrome, for example, typically perform in accord with their mental ages. Development of mindreading ability is an internally guided maturational process preceded and aided by acquisition of abilities to view moving objects as goal-directed, to monitor other people's gazes, and to tell when they see particular objects.

Children afflicted with autism, however, exhibit a strange "mindblindness" that selectively impedes their grasp of the mental. Experimental studies by Baron-Cohen and others reveal that even intelligent autistic adults usually fail to solve "false belief" tests that are easy for most five-year-olds. Suppose, for example, that Sally puts a marble in a box and departs, whereupon Anne transfers it to another location. When asked where Sally will look for the marble upon returning, autistic individuals of all ages usually indicate the marble's actual location, a response characteristic of normal three-year-olds. Numerous other tasks requiring understanding of false belief prove to be beyond the ken of most people with autism, irrespective of intelligence or training. Associated deficits in precursors of mindreading ability, such as gaze-monitoring and shared attention behaviors, have enabled Baron-Cohen to diagnose autism in very young children, long before the mindreading impairments appear.

In attempting to explain the findings, Baron-Cohen adopts a strategy known as the theory-theory. Theory-theorists hypothesize that mindreading abilities are grounded in inferential deployment of mental-state concepts via theory-like sets of principles. Versions of the approach have been developed by Jerry Fodor, Alan Leslie, and many others. If asked how a child manages to pass the above-mentioned false belief test, a theory-theorist might reply along the following lines: the child derives the conclusion that Sally will look in the box by invoking premises about Sally's desires, beliefs, etc. together with such principles as "Anyone who wants to find something and believes it to be in a certain place will tend to look there." The premises and principles need not be accessible to awareness or represented in language-like form; they may even be false—as eliminativists observe, many false theories work fairly well.

Baron-Cohen posits the existence of four innate information-processing mechanisms: the Intentionally Detector (ID), which attributes volitional states, such as goal-seeking, to moving objects; the Eye-Direction Detector (EDD), which computes gaze-direction and recognizes perceptual states of seeing; the Shared-Attention Mechanism (SAM), which generates triadic representations involving the self, another person, and a target object; and finally and most impor-