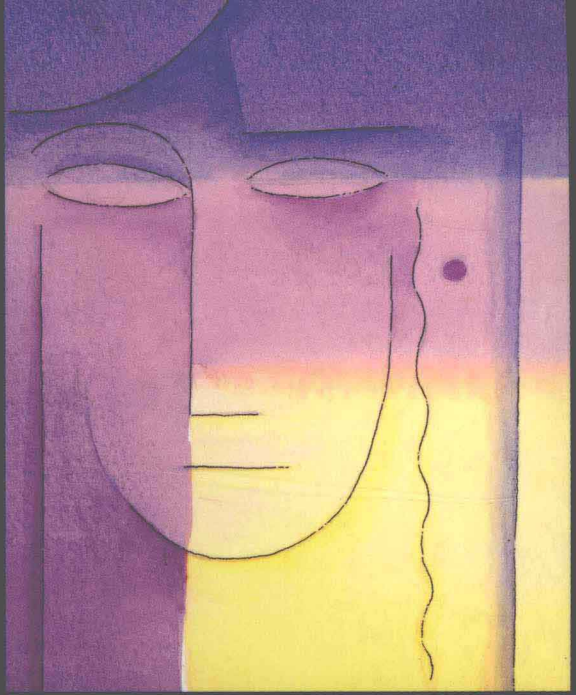

cognitive science

a philosophical introduction

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List of abbreviations

ADHD	attention deficit hyperactivity disorder
AI	artificial intelligence
ASCII	American Standard Code for Information Interchange
CFS	chronic fatigue syndrome
CNS	central nervous system
EEG	electroencephalograph
GOFAI	good old-fashioned artificial intelligence
IPS	information-processing system
PDP	parallel distributed processing
PET	positron emission tomography
SSH	symbol system hypothesis
T/T	task/tool
TOTE	test/operate/test/exit
TPP	Taxonomic Priority Principle

Preface

This book is based on the Machette Lectures, delivered at the University of Ohio, Athens OH in March 1998. It gives me great pleasure to acknowledge the generous support of the Machette Foundation for the lecture series and its subsequent publication. I am particularly grateful to the Philosophy Department of Ohio University at Athens OH for inviting me and for providing such a rewarding and stimulating environment in which to do philosophy. My special thanks to James Petrik, Donald Borchert and Albert Mosley for managing the executive side of the visit so efficiently.

The basic work on preparing the lectures and the text that accompanies them was carried out when I was Guest Professor at the Philosophy Institute, Aarhus University, Aarhus, Denmark. I am very grateful for the opportunity. I owe special thanks to Uffe Juul Jensen, Chairman of the Philosophy Institute, both for the original invitation and for the many ways in which he made my stay both profitable and agreeable. I am immensely grateful to friends and colleagues with whom I had many discussions around the topics of these lectures, in particular Hans Fink and Steen Brock, as well as friends and colleagues at Aalborg and Copenhagen Universities.

The final form of this text owes much to the feedback from three generations of students at Georgetown University, Washington DC, and to the students of the Honors Program at American University in that same great city.

I am particularly grateful to my friends and colleagues Ali Moghaddam and Darlene Howard for their invaluable advice and comments.

Rom Harré
Oxford and Washington DC

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I am grateful to the publishers of the following books for kind permission to reproduce various diagrams.

McLeod, P., Plunkett, K. and Rolls, E.T. (1998) *Introduction to Connectionist Modelling of Cognitive Processes*, Oxford: Oxford University Press.

Miller, G.A., Galanter, G. and Pribram, K.H. (1967) *Plans and the Structure of Behavior*, New York: Holt Rinehart & Winston.

Restak, R.M. (1995) *Brainscapes*, New York: Hyperion Press.

How to use this book in the classroom

Increasingly, over the last decade, many psychology departments are including required courses in philosophy of psychology in their curricula. The content and level of such courses vary widely. Some have been devoted exclusively to philosophy of science. Others have covered topics in philosophy of mind. The course on which this text is based deals with philosophical questions raised by the project of developing psychology as a science.

Psychology students have usually had little exposure to criticial reflections on the concepts employed in their courses on standard psychological topics. Nor are critical discussions of standard methods of research at all common in the methodology courses offered in most universities. Experience in teaching the philosophy of physics has shown that students studying a science gain most from a course which introduces philosophical issues in discussions of specific topics drawn from the science in question. This text is aimed at introducing the practice of philosophical reflection in relation to examples drawn from branches of psychology that are already covered in the usual curriculum. These are presented in a way that highlights aspects of scientific psychology of particular philosophical interest.

What is philosophy of science? The contents of courses range from studies of the logic of scientific enquiry to the sociology of scientific institutions. For the most part, the available textbooks in philosophy of science are not easy to adapt for use by psychology students. They seem increasingly to reflect the way that philosophy of science has become a specialist field detached from the sciences themselves. The tendency to confine discussion to rather abstract debates concerning topics of interest to logicians and other scholars of a formal bent has left a gap when one is looking for a text that will have some immediacy of impact on psychology students. To some extent, philosophy of mind has followed the same path, into an increasingly esoteric and specialized pattern of debate around topics that have become difficult to reintegrate into psychology courses proper. This text is an attempt to remedy the situation. The need for courses that stand back from the routine presentation of 'results' and 'theories' is felt in many departments. The courses

on which this text is based have been built up on the basis of the principle that one can be philosophical, that is one can stand back and reflect on the ontological, epistemological and methodological presuppositions of psychological practice – while remaining in close touch with that practice.

Increasingly, psychology is becoming polarized around two seemingly irreconcilable schools of thought. There are those who see, rightly, that the phenomena that psychologists study are discursive, that is, consist largely of meanings and the means by which people manage them. There are also those who see, rightly, that the instruments of cognition are material, the brain and nervous system. These positions can and should be reconciled. Courses such as those for which this book has been written could serve, one hopes, as part of a long-term project to integrate the seemingly diverse directions of cutting-edge research into a unified though hybrid discipline.

This is intended as a teaching text. Though it presents a certain point of view on controversial matters it is not intended as a treatise or monograph either in discursive psychology or artificial intelligence. I hope that enough detail has been provided as a general groundwork to the more technical aspects of contemporary cognitive psychology without the risk of intimidating undergraduates. In some universities, undergraduates may be taking as many as four other courses in the semester in which they are advised to take a philosophy course. It is essential, therefore, that examples are drawn, at least in part, from standard topics in psychology with which most will have become acquainted.

University libraries are rich in detailed studies and telling discussions of many of the topics treated here. I very much hope that students will be encouraged to pursue their own interests by consulting some of this literature. To that end, I have offered some suggestions for further reading beyond the supplementary excerpts following each Self-test section. These are only suggestions. They should not be regarded as in any way definitive of what is worth serious study.

The level of exposition presumes that classes will be attended mainly by students in their Junior or Senior years, who have already taken some psychology or philosophy courses. Specific psychological content has been presented in a simplified way, but without, I hope, becoming so schematized as to lead to misunderstandings.

The structure is keyed in to a twelve-week teaching term or semester, assuming classroom time set aside for tests and quizzes. Each 'Learning Point' is meant to summarize the material that would roughly comprise a single lecture. It is good pedagogical practice to maintain continuity in the course by using the Learning Point of one lecture to introduce the next. Each part or module is more or less self-contained, with sets of study questions appended for revision and self-testing. The study questions for each chapter are followed by suggested chapter-length readings from a list of co-texts which would be on library reserve. In practice each module fits a six-lecture pattern of teaching, completed by a review session and a test.

There is sufficient material in each part to allow different course patterns to be created by selection of particular topics. For example in Part I, Chapter 2 could be omitted or, in Part II, Chapter 4. In Part III, Chapter 8 could be left out, while

in Part IV, any one of Chapters 10, 11 or 12 could be used as an example of an integrated research program. Other patterns have been found to be workable, depending on departmental interests and requirements.

Co-textbooks

These should be on reserve in the library. Chapter-length readings are suggested for each self-test section at the end of each part. The books below have been selected not only on their intrinsic merits but also because they are believed to be in print. ISBNs have been included for the convenience of librarians.

Part One The nature and methods of science

Harré, R. (2000) *One Thousand Years of Philosophy*, Oxford: Blackwell (ISBN 0 631 21901 3).

McErlean, J. (2000) *Philosophies of Science: From Foundations to Contemporary Issues*, Belmont CA: Wadsworth (ISBN 0 534 55163 7).

Morgan, M. and Morrison, M.S. (1999) *Models as Mediators*, Cambridge: Cambridge University Press (ISBN 0 52 165571 4).

Part Two The search for a science of human behavior

Robinson, D.N. (1995) *An Intellectual History of Psychology*, third edition, London: Arnold (ISBN 0 340 66212 3).

Copeland, J. (1998) *Artificial Intelligence*, Oxford: Blackwell (ISBN 0 19 852313 0).

Part Three Towards a scientific psychology

Edwards, D. (1997) *Discourse and Cognition*, London: Sage (ISBN 0 80 397697 6).

Dennett, D. (1987) *The Intentional Stance*, Cambridge MA: MIT Press (ISBN 0 262 04093 X).

Copeland, J. (1998) *Artificial Intelligence*, Oxford: Blackwell (ISBN 0 19 852313 0).

Part Four Cognitive science in action

Cohen, G., Kiss, G. and Le Voi, M. (1993) *Memory: Current Issues*, Buckingham and Philadelphia: Open University Press (ISBN 0 335 19079 0).

Way, E.C. (1992) *Knowledge Representation and Metaphor*, Dordrecht: Kluwer (ISBN 1851516390).

Gillett, Grant (1999) *The Mind and its Discontents: an Essay in Discursive Psychiatry*, Oxford: Oxford University Press (ISBN 0 19 852313 0).

Additional readings

There are many useful publications covering aspects of the topics covered in this text. The following are recommended for supplementary reference.

Boden, M.A. (1988) *Artificial Intelligence in Psychology*, Cambridge MA: MIT Press.

Button, G., Coulter, J., Lee, J.R.E. and Sharrock, W. (1995) *Computers, Minds and Conduct*, Cambridge: Polity Press.

Dreyfus, H.L. (1972) *What Computers Can't Do: a Critique of Artificial Reason*, New York: Harper & Row.

Engel, S. (1999) *Context is Everything: The Nature of Memory*, New York: Freeman

Fulford, K.W.M. (1998) *The Philosophical Basis of Ethics: Standards in Psychiatry*, Preston: University of Lancaster Press.

Giere, R.N. (1988) *Explaining Science: a Cognitive Approach*, Chicago: University of Chicago Press.

Gigenrenzer, G. and Goldstein, D.G. (1996) 'Mind as computer: birth of a metaphor', *Creativity Research Journal* 9: 131–44.

Gillies, A. (1996) *Artificial Intelligence and Scientific Method*, Oxford: Oxford University Press, chapter 2.

Luria, A.R. (1981) *Language and Cognition*, New York: Wiley.

Sobel, C.P. (2001) *The Cognitive Sciences*, Mountain View CA: Mayfield.

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