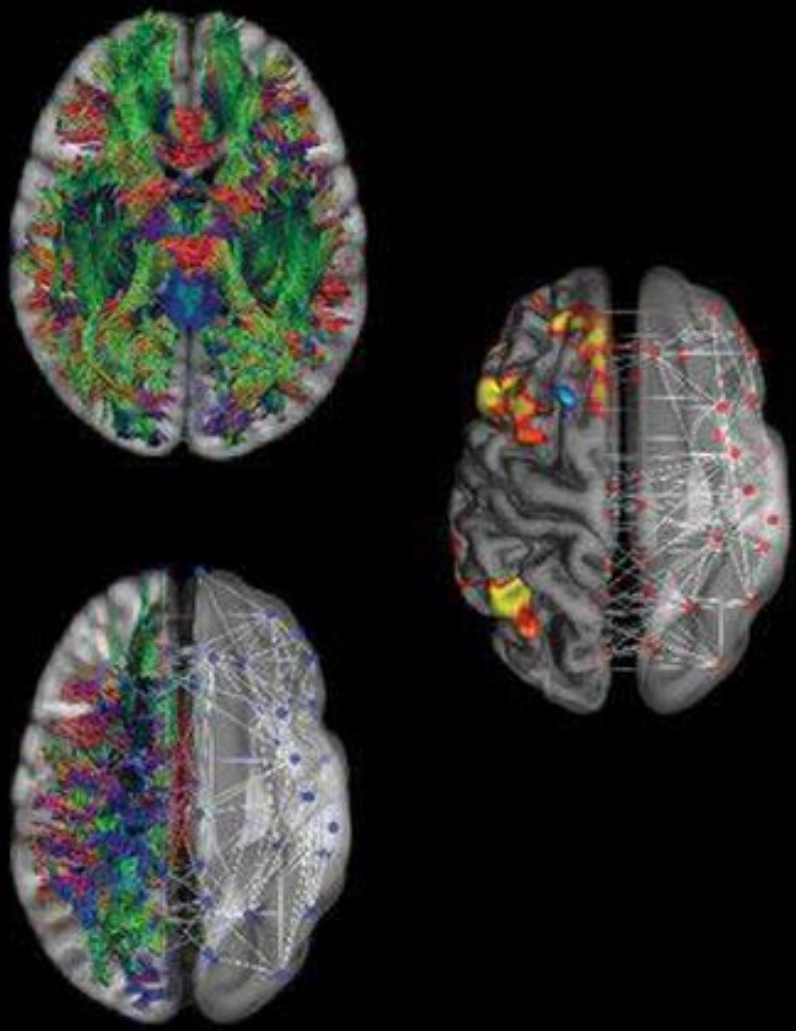
THE CAMBRIDGE HANDBOOK OF INTELLIGENCE AND COGNITIVE NEUROSCIENCE

Edited by Aron K. Barbey, Sherif Karama & Richard J. Haier



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Can the brain be manipulated to enhance intelligence? The answer depends on neuroscience progress in understanding how intelligence arises from the interplay of gene expression and experience in the developing brain and how the mature brain processes information to solve complex reasoning problems. The bad news is the issues are nightmarishly complex. The good news is there is extraordinary progress from researchers around the world. This book is a comprehensive sampling of recent exciting results, especially from neuroimaging studies. Each chapter has minimum jargon, so an advanced technical background is not required to understand the issues, the data, or the interpretation of results. The prospects for future advances will whet the appetite of young researchers and fuel enthusiasm for researchers already working in these areas. Many intelligence researchers of the past dreamed about a day when neuroscience could be applied to understanding fundamental aspects of intelligence. As this book demonstrates, that day has arrived.

ARON K. BARBEY is Professor of Psychology, Neuroscience, and Bioengineering at the University of Illinois at Urbana-Champaign. He directs the Intelligence, Learning, and Plasticity Initiative, and the Decision Neuroscience Laboratory at the Beckman Institute for Advanced Science and Technology.

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RICHARD J. HAIER is Professor Emeritus in the School of Medicine, University of California, Irvine. His PhD in psychology is from Johns Hopkins University, he has been a staff fellow at NIMH and on the faculty of Brown University School of Medicine.

"This exciting book makes an elegant case that human intelligence is not the result of a test. It is the consequence of a brain. Drawing on state-of-the-art imaging methods, the reader is afforded a comprehensive view of the substrates enabling our most valued mental abilities."

Scott T. Grafton, Bedrosian-Coyne Presidential Chair in Neuroscience and Director of the Brain Imaging Center, University of California at Santa Barbara

"Our scientific understanding of human intelligence has advanced greatly over the past decade in terms of the measurement and modeling of intelligence in the human brain. This book provides an excellent analysis of current findings and theories written by top international authors. It should be recommended to students and professionals working in this field."

Sarah E. MacPherson, Senior Lecturer in Human Cognitive Neuroscience, University of Edinburgh

"This handbook focuses on the brain, but also integrates genetics and cognition. Come for a comprehensive brain survey and get the bonus of a panoramic foreshadowing of integrated intelligence research and applications."

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"This handbook captures the conceptualization and measurement of intelligence, which is one of psychology's greatest achievements. It shows how the advent of modern imaging techniques and large-scale data sets have added to our knowledge about brain–environmental–ability relationships and highlights the controversy in this rapidly expanding field."

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"This handbook assembles an impressive group of pioneers and outstanding young researchers at the forefront of intelligence neuroscience. The chapters summarize the state of the field today and foreshadows what it might become."

Lars Penke, Professor of Psychology, Georg August University of Göttingen

"This book is a tribute to its topic. It is intelligently assembled, spanning all aspects of intelligence research and its applications. The authors are distinguished experts, masterfully summarizing the latest knowledge about intelligence obtained with cutting-edge methodology. If one wants to learn about intelligence, this is the book to read."

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