
Intelligence

Reconceptualization and Measurement

Edited by

Helga A. H. Rowe

IEA

ACER

INTELLIGENCE: RECONCEPTUALIZATION AND MEASUREMENT

Edited by
HELGA A. H. ROWE
Australian Council for Educational Research



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Preface

Most of us who are engaged in research agree that our work is more likely to be profitable when it results from the accumulation of knowledge acquired through projects undertaken within a coherent framework, rather than through single, isolated studies. To establish such a framework, researchers must be provided with the opportunity to exchange and refine their ideas and viewpoints. National and international conferences serve as examples of the role such meetings can play in providing a vehicle for increased communication, synthesis, summary and cross-area fertilisation among researchers working within specialised areas of psychological research and development. But conferences often serve more the sharing of specific information and keeping in touch. Conferences frequently fail to provide real opportunities for extensive reflection and debate.

The contributors to this book met together for two and one half days in just such reflection and debate in a *Seminar on Intelligence* from 26 to 28 August 1988 at the Southern Cross Hotel, Melbourne, Australia. They were asked not to present papers but to engage in a debate in front of an audience of nearly 300 academics and practitioners working in psychology and related disciplines. The aim was to offer a number of researchers who reflect current approaches to the investigation of 'intelligence' (conceived very broadly) and who have made significant contributions to existing knowledge, an opportunity to discuss their work in relatively broad perspective, and to consider explicitly how their findings and the knowledge they have gained could be brought to bear upon the development of more general theories, and upon approaches towards the solution of practical problems.

One year later chapters for this book were submitted. However, the purposes of the Seminar and the book were different. The aim of the Seminar had been to

discuss unifying approaches to intelligence, and long term goals which might be shaping the course of research. The aim of the book was to give the authors of chapters the opportunity to write about their personal current research projects.

The Seminar was planned and arranged by the Australian Council For Educational Research (ACER) as its contribution to the Australian Bicentennial celebrations. Fourteen countries were represented at the Seminar. The Seminar was also regarded as a satellite conference preceeding the *24th International Congress of Psychology*, which took place in Sydney between 28 August and 2 September 1988.

I would like to express my thanks to everyone who contributed to the success of the *ACER Seminar on Intelligence*. I am especially indebted to the Council of the ACER for making the meeting possible. Without their support not only would there have been no Seminar, but this book would not have been written.

My largest debt is owed to the present and previous directors of the ACER, Dr. Barry McGaw and Dr. John P. Keeves for advice, financial assistance and, above all, moral support.

Helga A.H. Rowe

Principal Research Officer

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KEVIN F. COLLIS has been Professor of Education at the University of Tasmania since 1977. Before he began his academic research career at the University of Newcastle in 1968 he taught mathematics, science and logic in Queensland private and state secondary schools. His current research interests are in cognitive development, mathematics and science education, and evaluation. He is the author of many journal articles in both professional and academic journals and has authored or coauthored several monographs.

JOHN D. CRAWFORD obtained his BSc in Physics and Master's degree in Electrical Engineering at the University of Sydney, and more recently a Ph.D. in Psychology at the University of New South Wales. He is now a Lecturer in Applied Psychology in the Faculty of Business at the University of Technology,

Sydney. His doctoral work was concerned with the relationship between common measures of intelligence and tests of sustained attention, and with the use of these tests to investigate different theoretical accounts of the nature of general intelligence. Present interests include the study of decision making skills and how they relate to current models of the structure of mental abilities, such as Gf/Gc theory, and to the concept of "practical" intelligence.

ARTHUR J. CROPLEY was born in South Australia in 1935 and graduated from Adelaide University in Arts and Education. After seven years as a school teacher in Australia, England and Canada, he attended the University of Alberta and obtained the Ph.D. in Educational Psychology in 1965. He is presently professor of psychology in the University of Hamburg, after a number of years as lecturer in psychology in the University of New England (NSW), and Assistant to Full Professor in the University of Regina (Canada). He is the author of 14 books on creativity, lifelong learning and adaptation of immigrants. In addition he has published about 100 papers and chapters on these topics, and has obtained a number of substantial research grants from various bodies.

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ROBERT GLASER's range of research takes in major problems in complex cognition and human abilities. He has studied the properties of subject matter competence and expertise, and the role of structures of knowledge in learning; the information processing requirements of performance on aptitude tests; and the differences between novices' and experts' problem solving abilities in scientific problem solving. He has continuing interests in learning theory and the assessment of human performance. Robert Glaser is Professor of Psychology and Education, and Director of the Learning Research and Development Center at the University of Pittsburgh. He has served as president of major scientific and professional associations in his field and as editor of major journals. He has

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RONALD F. JARMAN obtained a Bachelor of Science degree in mathematics from the University of British Columbia in 1970, a Master of Arts degree in educational measurement and evaluation and applied data analysis from the University of Toronto in 1972, and a Doctor of Philosophy in educational psychology from the University of Alberta in 1975. Since 1975, Dr. Jarman has been teaching and engaged in research at the University of British Columbia in the Department of Educational Psychology and Special Education, where he is a Professor. His Jarman's primary research interests are in the areas of models of human intelligence and the neuropsychological bases of cognitive processes.

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KJELL RAAHEIM is Professor of Psychology at the University of Bergen, Norway. He graduated in psychology at the University of Oslo in 1955 and received his doctorate at the University of Bergen in 1963. He has been working towards making the Department of Cognitive Psychology in Bergen into one of the most influential institutions in Scandinavia in psychological research and the teaching of psychology at tertiary level. His list of published monographs, popular books and textbooks includes four books in English. With Dr. Wankowski at the University of Birmingham he was the author of *Helping Students to Learn at University*.

MARC N. RICHELLE was born in 1930 and has been Professor of Experimental Psychology and Head of the Psychology Laboratory, University of Liege, Belgium, since 1965. He received his university education at Liege, Geneva, and Harvard. His fields of research are in learning (animals and humans), cognitive development, experimental psychopharmacology, psychology of time, history and epistemology of psychology. He was President of the Belgian Psychology Society (1968–1970) and Société de Psychologie Scientifique de Langue Française (1989–1991). He is the author of more than 150 publications. Among the dozen books he has published are: *Les Conduites Créatives* (with C. Bodson, 1974), *Manuel de Psychologie* (with R. Droz, 1976), *L'acquisition du langage* (1972), *Skinner* (1978), *Time in Animal Behaviour* (with H. Lejeune, 1980), and *L'explicitation en Psychologie* (edited with X. Seron, 1980).

DAVID L. ROBINSON was born in Ireland where he spent his early adult years working in industry and developing a career in production management. At the age of 30 he left industry to study psychology at the University of Ulster. Later, after obtaining a Doctorate at the University of Oxford, he and his family moved to the United States. In the United States he was appointed Research Fellow at Brown University. This was followed by a research appointment with the United States National Institutes of Health. Dr. Robinson subsequently moved to Australia where he is now Senior Lecturer in Psychology at the University of Sydney. His abiding interest has been the relationship between brain-function and behavior and he takes the view that an integrated science of Psychology can only be achieved through better understanding of brain-behavior relationships.

HELGA A.H. ROWE is the Principal Research Fellow of The Australian Council For Educational Research. She was one of the first mature age students in the

Department of Psychology of the University of Queensland, where she enrolled for her degree in 1968, when her youngest child was 2-years-old. She and husband Harold have four sons and one daughter. In 1969 she was awarded a University of Queensland Teaching Fellowship. She graduated with first class honors in 1971 (BA, HONs) and was awarded the Gold medal of the University of Queensland. In 1980, she obtained a Ph.D. in the Department of Psychology, Melbourne University. Prior to her work with ACER she was on the staff of the University of Queensland, first in the Department of Education, then in the Department of Psychology. She is the author of a number of psychological and educational tests and test batteries, including the *ACER Early School Series*, *Checklists for Schoolbeginners* and the *Non-verbal Abilities Tests (NAT)*. She has published three books and contributed numerous chapters and articles covering a wide range of topics in educational psychology relating to individual differences and cognitive development. Her current research relates to the development of cognitive processes in real work and technological environments, and to implications of technology for learning and teaching.

LAZAR STANKOV was born in Belgrade in 1941. He completed a Masters degree at the University of Belgrade and a Ph.D. at Denver, where he worked with Professor John Horn, investigating auditory abilities in the context of a fluid and crystallized intelligence structure. In 1973 he took a post at the University of Sydney and is currently a Reader in Psychology. His major recent research makes use of competing tasks to investigate the relationship between attention and intelligence. He is living in the Blue Mountains west of Sydney with his wife Sonni (a manufacturing jeweller) and his two teenage daughters Naumi and Ise.

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INTELLIGENCE: RECONCEPTUALIZATION AND MEASUREMENT

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1

Introduction: Paradigm and Context

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This book deals with theoretical issues relating to human “intelligence,” its manifestation, development, and measurement. It focuses on intelligence because intelligence plays an important part in learning, involves higher-order thinking, problem solving, and creativity, and because of its importance to an individual’s performance and personal success in everyday life. As reform in education continues, it is becoming particularly important that we develop a rich understanding of what intelligence is and how to foster it.

The authors call attention to some questions that have not been raised previously, and to many of the important and relevant issues that must be addressed in the study of cognition and in more general psychological research. One purpose of this book is to propose perspectives for future research, not so much with the intent of predicting it as with that of shaping it. However, perhaps to the dismay of some readers, the contributors to this book are not providing an agenda for future research. To suggest a single intellectual path or set of paradigms to guide research on intelligence is impossible, and if it were possible would probably be counterproductive. A forward move in intelligence research demands the reflection on its many facets and research from a variety of perspectives, which, hopefully, in the end might lead to certain syntheses.

Intelligence research in the 1980s might go down as a decade of publications that decried the quality of theories, and questioned the usefulness of the concept of intelligence and its measurement. This book is not about new theories. The term reconceptualization is used in the sense of “re-visiting” and “re-orientation” with the intention to come to know again and gain a new understanding of the processes underlying human intellectual functioning, i.e., the development and operation of human intelligence.