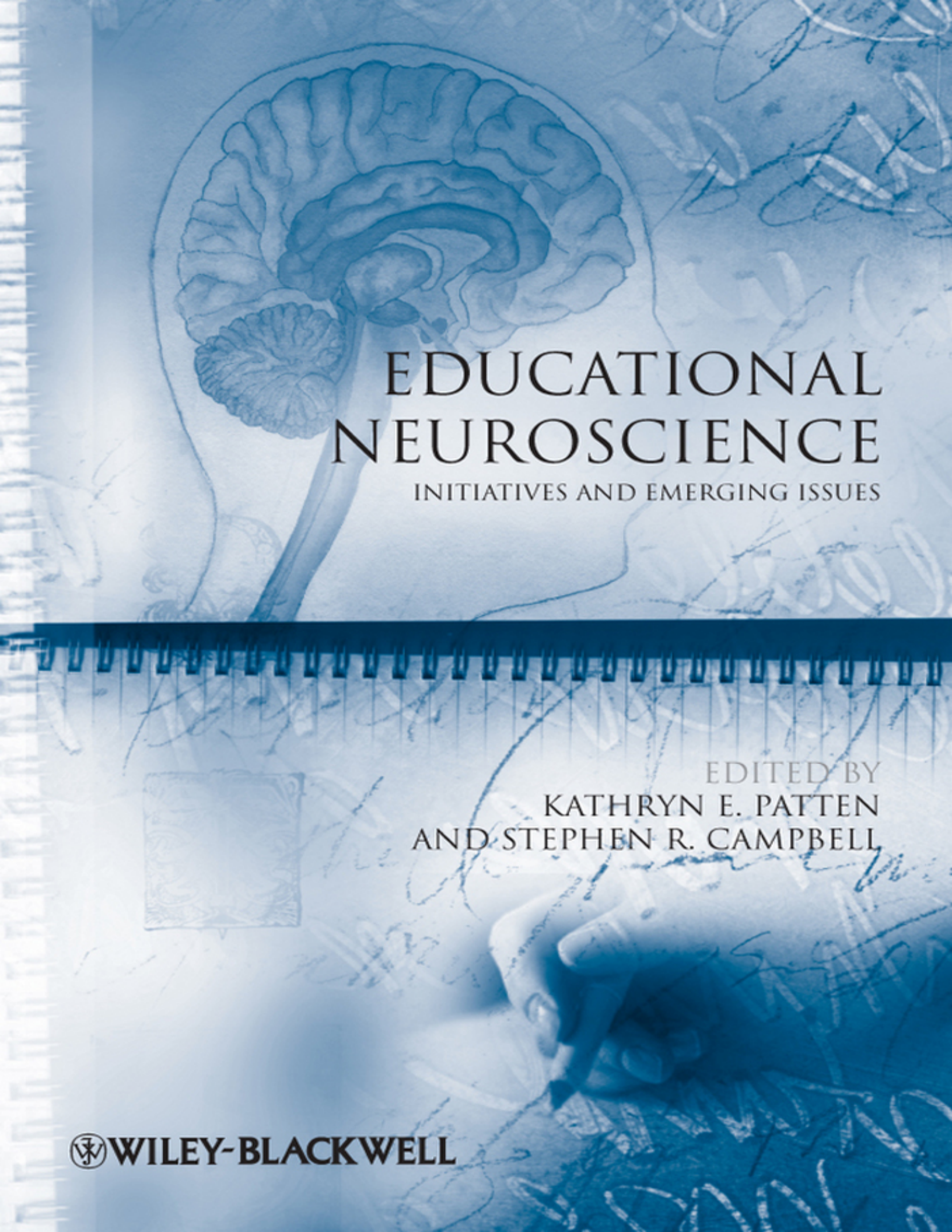

EDUCATIONAL NEUROSCIENCE

INITIATIVES AND EMERGING ISSUES

EDITED BY
KATHRYN E. PATTEN
AND STEPHEN R. CAMPBELL

WILEY-BLACKWELL

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Educational Philosophy and Theory Special Issue Book Series

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Foreword

The *Educational Philosophy and Theory* Book Series is dedicated to enhancing the ongoing conversations surrounding all aspects of educational philosophy, including areas of pure and applied educational research. The book series aims to extend the dialogues of educational philosophy by incorporating work from the related fields of arts and sciences, as well as work from professional educators. This monograph based on the special issue entitled *Educational Neuroscience* and edited by Kathryn Patten and Stephen Campbell brings together fourteen chapters, including an Introduction, to review and discuss an emerging field sometimes also referred to as Mind Brain Education (MBE), after the journal established by Kurt Fischer in 2007. Both Kate Patten and Sen Campbell are from the Educational Neuroscience Laboratory (respectively, Outreach Coordinator and Director) established at Simon Fraser University in 2006 through the Canadian Foundation for Innovation's New Opportunities Program. The Laboratory called Engrammetron, after the 'engram' or 'memory traces' hypothesized by Karl Lashley (1890–1958) the father of modern neuroscience, was set up with a primary specialization in mathematics education as a facility to measure, analyze and observe through various instruments and methods (including, electroencephalography (EEG), electrocardiography (EKG), electromyography (EMG), and eye-tracking (ET) capability), patterns of 'mind brain' behaviour. The field is very recent and emerging quickly with major centres or research networks established in London, Cambridge, Harvard and Bristol:

- London (Centre for Educational Neuroscience, http://www.educationalneuroscience.org.uk/)

- Cambridge (Centre for Neuroscience in Education, http://www.educ.cam.ac.uk/centres/neuroscience/)
- Harvard (Brain Mind, and Education, http://www.gse.harvard.edu/academics/masters/mbe/)
- Bristol (The NeuroEducational Research Network, http://www.neuroeducational.net/)

All established in the past five years, these facilities advertise themselves as transdisciplinary projects designed to synthesize biological, cognitive and social dimensions of learning within a developmental psychology framework that pays homage to Piaget. The Cambridge Centre states 'we aim to understand how the brain functions and changes during the development of reading and maths, exploring the development of related skills such as language, memory, numerosity and attention'. The Harvard initiative advertises an interdisciplinary programme 'including not only psychology, pedagogy, and neuroscience, but also philosophy, anthropology, linguistics, computer science, and other relevant disciplines.' The Centre for Educational Neuroscience at London, an inter-institutional project of University College London, the Institute of Education and Birkbeck College, on its website records conference presentations for 'Educational Neuroscience: An Emerging Discipline' held at Birkbeck in June 2010 with papers on Individual differences in numerical and mathematical abilities, the social brain in adolescence, aspects of numeracy and math learning disability, school science, language and literacy, as well as autism and dyslexia.

In addition, there also exist various SIGS and forums. Most organizations and educational neuroscientists tend to picture themselves as providing a link between biology and cognition; many also acknowledge links to other disciplines, including philosophy and technology. In his scoping chapter Sen Campbell pictures educational neuroscience as a new area of educational research that goes beyond a conception

of applied cognitive neuroscience. Drawing on a theory of the embodied mind put forward in the early 1990s by Francisco Varela and his colleagues who sought to overcome the Cartesian Anxiety by complementing cognitivism as an outgrowth of cybernetics with emergence or connectionism, Campbell focuses on subjective experience to argue ‘any changes in subjective experience must in principle manifest objectively in some manner as changes in brain, body, and behaviour, and vice versa’ (pp. 9–10).

What I like about Campbell’s conception is that it is based on philosophical commitments and a good working knowledge of philosophy of mind which makes it both suitable and highly relevant for our readers and for its inclusion in the *Educational Philosophy and Theory* book series.

I am grateful to Kate Patten and Stephen Campbell for their editorial work in bringing such an excellent international collection together from leading scholars in this rapidly emerging field, themselves included. Educational neuroscience promises new characterizations of the learner in terms of brain, genetic and hormonal states; its applications in mathematics, literacy and social or emotional cognition are interesting even although it still faces formidable methodological and philosophical challenges; and yet already it has already accomplished important work such as deconstruction of prevalent neuromyths such as left/right or male/female brain.

Michael A. Peters

University of Illinois