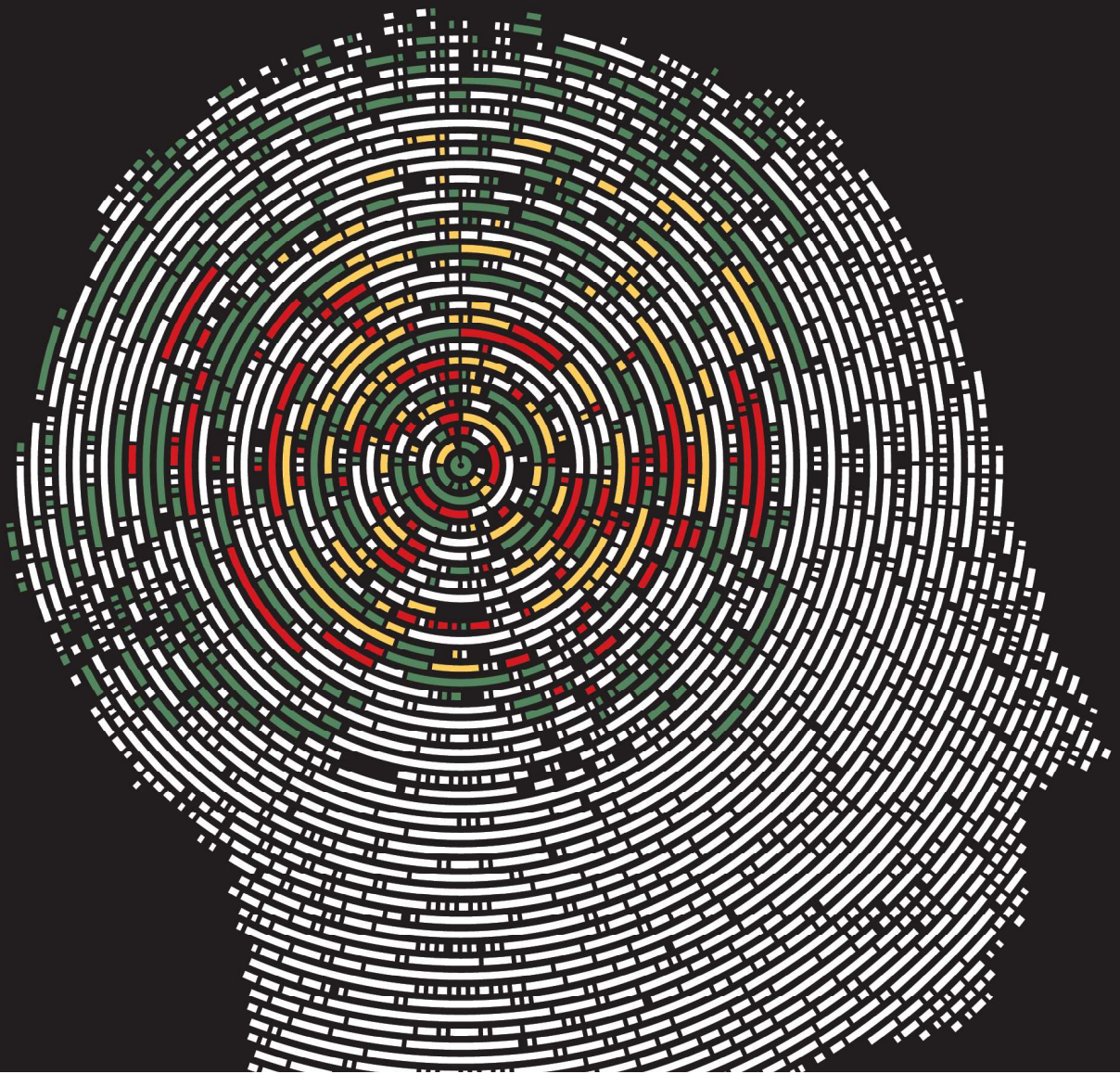


BRAIN STIMULATION AND BEHAVIORAL CHANGE

EDITED BY: Claudio Lucchiari, Nicholas J. Kelley, Maria E. Vanutelli and
Roberta Ferrucci

PUBLISHED IN: Frontiers in Behavioral Neuroscience





frontiers

Frontiers Copyright Statement

© Copyright 2007–2019 Frontiers Media SA. All rights reserved.

All content included on this site, such as text, graphics, logos, button icons, images, video/audio clips, downloads, data compilations and software, is the property of or is licensed to Frontiers Media SA ("Frontiers") or its licensees and/or subcontractors. The copyright in the text of individual articles is the property of their respective authors, subject to a license granted to Frontiers.

The compilation of articles constituting this e-book, wherever published, as well as the compilation of all other content on this site, is the exclusive property of Frontiers. For the conditions for downloading and copying of e-books from Frontiers' website, please see the Terms for Website Use. If purchasing Frontiers e-books from other websites or sources, the conditions of the website concerned apply.

Images and graphics not forming part of user-contributed materials may not be downloaded or copied without permission.

Individual articles may be downloaded and reproduced in accordance with the principles of the CC-BY licence subject to any copyright or other notices. They may not be re-sold as an e-book.

As author or other contributor you grant a CC-BY licence to others to reproduce your articles, including any graphics and third-party materials supplied by you, in accordance with the Conditions for Website Use and subject to any copyright notices which you include in connection with your articles and materials.

All copyright, and all rights therein, are protected by national and international copyright laws.

The above represents a summary only. For the full conditions see the Conditions for Authors and the Conditions for Website Use.

ISSN 1664-8714
ISBN 978-2-88945-838-7
DOI 10.3389/978-2-88945-838-7

About Frontiers

Frontiers is more than just an open-access publisher of scholarly articles: it is a pioneering approach to the world of academia, radically improving the way scholarly research is managed. The grand vision of Frontiers is a world where all people have an equal opportunity to seek, share and generate knowledge. Frontiers provides immediate and permanent online open access to all its publications, but this alone is not enough to realize our grand goals.

Frontiers Journal Series

The Frontiers Journal Series is a multi-tier and interdisciplinary set of open-access, online journals, promising a paradigm shift from the current review, selection and dissemination processes in academic publishing. All Frontiers journals are driven by researchers for researchers; therefore, they constitute a service to the scholarly community. At the same time, the Frontiers Journal Series operates on a revolutionary invention, the tiered publishing system, initially addressing specific communities of scholars, and gradually climbing up to broader public understanding, thus serving the interests of the lay society, too.

Dedication to Quality

Each Frontiers article is a landmark of the highest quality, thanks to genuinely collaborative interactions between authors and review editors, who include some of the world's best academicians. Research must be certified by peers before entering a stream of knowledge that may eventually reach the public – and shape society; therefore, Frontiers only applies the most rigorous and unbiased reviews.

Frontiers revolutionizes research publishing by freely delivering the most outstanding research, evaluated with no bias from both the academic and social point of view. By applying the most advanced information technologies, Frontiers is catapulting scholarly publishing into a new generation.

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the Frontiers Journals Series: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area! Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers Editorial Office: researchtopics@frontiersin.org

BRAIN STIMULATION AND BEHAVIORAL CHANGE

Topic Editors:

Claudio Lucchiari, Università degli Studi di Milano, Italy

Nicholas J. Kelley, Northwestern University, United States

Maria E. Vanutelli, Università degli Studi di Milano, Italy

Roberta Ferrucci, IRCCS Ca 'Granda Foundation Maggiore Policlinico Hospital (IRCCS), Italy

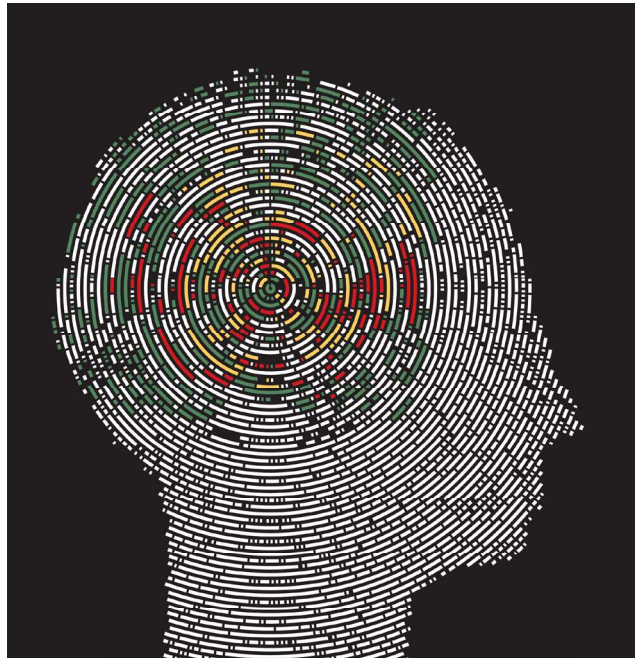


Image: igor kisselev/Shutterstock.com

The eBook entitled “Brain Stimulation and Behavioral Change” is a collection of articles about the use of transcranial electric stimulation (tES) to change behaviors and face pathological conditions, to enhance cognition and to explore cerebral functions using safe and non-invasive brain modulation techniques. The tESs include transcranial direct current stimulation (tDCS), transcranial alternate current stimulation (tACS), and, due to the way it induces changes in the brain, Transcranial Magnetic Stimulation (TMS). The use of tES has recently exploded. Certainly, one reason for this explosion of research is that it is a cheap way to change behavior. However, on the other hand, we still know very little about the neural mechanisms that underlie tES. The present eBook includes both original studies and reviews. It covers a wide scope of arguments, including studies aimed at testing the potential ability of tES in mitigating physical and psychiatric symptoms, and to support

neurological rehabilitation, enhancing reading abilities, motor abilities, and creativity. Furthermore, some contributions about the role of tES in discovering and mapping the neuro-functional correlates of higher cognitive functions are also included. The common background of the contributions included in the eBook lies in the idea that we need sound scientific evidence about how to move these techniques from labs to real-life contexts. Addressing these issues and understanding the real potentialities of tES in clinical and non-clinical applications require a significant cross-fertilization between disciplines. We hope this eBook will be able to boost the discussion on this vital topic.

Citation: Lucchiari, C., Kelley, N. J., Vanutelli, M. E., Ferrucci, R., eds. (2019). Brain Stimulation and Behavioral Change. Lausanne: Frontiers Media.
doi: 10.3389/978-2-88945-838-7

Table of Contents

1. INTRODUCTION

06 *Editorial: Brain Stimulation and Behavioral Change*

Claudio Lucchiari, Nicholas J. Kelley, Maria Elide Vanutelli and Roberta Ferrucci

2. BRAIN STIMULATION TO IMPROVE PATHOLOGICAL CONDITIONS

09 *At-Home Transcranial Direct Current Stimulation (tDCS) With Telehealth Support for Symptom Control in Chronically-Ill Patients With Multiple Symptoms*

Alexa Riggs, Vaishali Patel, Bhaskar Paneri, Russell K. Portenoy, Marom Bikson and Helena Knotkova

2.1 NEUROLOGICAL APPLICATIONS

19 *Behavioral and Neurophysiological Effects of Transcranial Direct Current Stimulation (tDCS) in Fronto-Temporal Dementia*

Roberta Ferrucci, Simona Mrakic-Sposta, Simona Gardini, Fabiana Ruggiero, Maurizio Vergari, Francesca Mameli, Andrea Arighi, Marco Spallazzi, Federica Barocco, Giovanni Michelini, Anna Margherita Pietroboni, Laura Ghezzi, Giorgio Giulio Fumagalli, Giordano D'Urso, Paolo Caffarra, Elio Scarpini, Alberto Priori and Sara Marceglia

30 *Unilateral Application of Cathodal tDCS Reduces Transcallosal Inhibition and Improves Visual Acuity in Amblyopic Patients*

Tommaso Bocci, Francesco Nasini, Matteo Caleo, Laura Restani, Davide Barloscio, Gianluca Ardolino, Alberto Priori, Lamberto Maffei, Marco Nardi and Ferdinando Sartucci

39 *Effects of Multi-Session Repetitive Transcranial Magnetic Stimulation on Motor Control and Spontaneous Brain Activity in Multiple System Atrophy: A Pilot Study*

Zhu Liu, Huizi Ma, Victoria Poole, Xuemei Wang, Zhan Wang, Yaqin Yang, Lanxi Meng, Brad Manor, Junhong Zhou and Tao Feng

46 *Cathodal tDCS Over Motor Cortex Does not Improve Tourette Syndrome: Lessons Learned From a Case Series*

Nora Behler, Bianka Leitner, Eva Mezger, Elif Weidinger, Richard Musil, Bernhard Blum, Beatrice Kirsch, Linda Wulf, Lisa Löhrs, Christine Winter, Frank Padberg and Ulrich Palm

2.2 PSYCHIATRIC CONDITIONS

53 *Transcranial Direct Current Stimulation, Symptomatology, and Cognition in Psychosis: A Qualitative Review*

Tina Gupta, Nicholas J. Kelley, Andrea Pelletier-Baldelli and Vijay A. Mittal

63 *New Treatment Perspectives in Adolescents With Anorexia Nervosa: The Efficacy of Non-invasive Brain-Directed Treatment*

Floriana Costanzo, Deny Menghini, Antonella Maritato, Maria C. Castiglioni, Alberta Mereu, Cristiana Varuzza, Valeria Zanna and Stefano Vicari