

Journal of Neurotherapy: Investigations in Neuromodulation, Neurofeedback and Applied Neuroscience

A Review of: “Quantitative EEG, Event-Related Potentials And Neurotherapy, by Juri Kropotov”

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Published online: 19 May 2009.

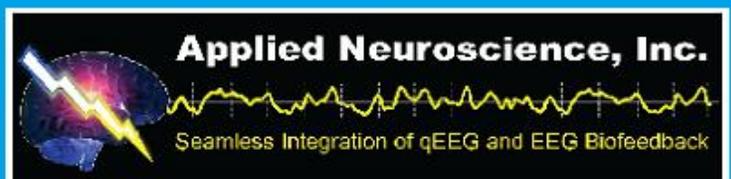
To cite this article: Reviewed by Sarah Prinsloo PhD (2009) A Review of: “Quantitative EEG, Event-Related Potentials And Neurotherapy, by Juri Kropotov”, *Journal of Neurotherapy: Investigations in Neuromodulation, Neurofeedback and Applied Neuroscience*, 13:2, 127-128, DOI: [10.1080/10874200902885969](https://doi.org/10.1080/10874200902885969)

To link to this article: <http://dx.doi.org/10.1080/10874200902885969>

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BOOK REVIEWS

QUANTITATIVE EEG, EVENT-RELATED POTENTIALS AND NEUROTHERAPY. Juri Kropotov. *Academic Press, San Diego, California, 2009, 600 pages, ISBN: 978-0-12-374512-5.*

In his introduction Dr. Kropotov outlines several intentions for his book: (a) “to provide a holistic picture of the qEEG and event-related potentials as a recently unified scientific field,” (b) “to present a unified description of the methods of quantitative EEG and ERPs,” (c) “to give a scientifically based overview of all existing approaches in the field of neurotherapy,” and (d) “to provide the reader with practical knowledge.” I found that *Quantitative EEG, Event-Related Potentials and Neurotherapy* more than met these goals. Practitioners interested in a better understanding of brain function and the latest in research findings will find Juri Kropotov’s book an invaluable resource. Although basic principals are incorporated in the book as in other texts, the author presents this information in a way that makes the concepts readily comprehensible, and that makes this book an outstanding resource for practitioners from a variety of experience levels.

Dr. Kropotov obviously has a passion for his work and, as becomes apparent in the introduction and first few chapters, a gift for explaining scientific material in a way in which readers from varying backgrounds may understand and put to use. This book is not a quick read, however, and no space is wasted on the unimportant—it is an

in-depth exploration of the mechanisms of brain function and what the latest research has to tell us. The focus of the book is brain physiology and the representation of physiology via EEG.

The introduction and subsequent sections include a glossary as well as visual aids. The book is organized in such a way that the charts, diagrams, and subheadings throughout could be a book by themselves, carefully giving deeper meaning to the concepts addressed in the readings. These serve as a necessary adjunct to understanding the research outlined in each chapter. The schematics are visual supplements to the models discussed in the text as well as experimental results and include examples of intracranial and 19-channel EEG recordings.

The introduction covers the basic concepts of QEEG and neurotherapy. For example, the author discusses the place of EEG in neuroscience and medicine and presents a description of various methods of tracing brain function, fast-forwarding to current interest in endophenotypes and pharmaco-EEG.

The book is then divided into three main parts, with the first section covering EEG rhythms. The brainwaves of delta, theta, alpha, and beta are explored in-depth including neuronal mechanisms, functional meaning, and abnormalities. The first section also includes chapters addressing QEEG endophenotypes, paroxysmal events, and methods of analysis of background EEG. Progressing through the chapter, the reader will become familiar with subheadings including methods of analysis, anatomical

areas, amplifiers, varying types of montages, analysis, filtering, and wavelet transformation, ICA, and artifact correction. Mathematical formulations are included in this chapter as well as in subsequent chapters and can become laborious, however fascinating, for the clinician not familiar with such material. The section is summarized with educational software that allows the reader to “practice” EEG/QEEG processing.

After reading the second section, the reader will have a good knowledge of the basis of brain potentials associated with information flow as a result of some event (ERPs). Titled “Event Related Potentials,” this section addresses systems of the brain including sensory systems, attentional networks, executive, affective, and memory systems. For example, the executive system is examined by means of subheadings that include psychological aspects of function, anatomy, wiring and circuitry, EEG recordings, and memory. Neuronal networks and ERPs are discussed in-depth. This section is intricately tied to anatomical descriptions of functioning and for those readers not familiar with ERPs and neural networks; the information provides an excellent basis for understanding both the concepts in the section and the preceding research.

The third section explores disorders of brain systems including attention deficit hyperactivity disorder, schizophrenia, addiction, obsessive-compulsive disorder, depression, and Alzheimer’s disease. Interesting subheadings vary from disorder to disorder but many include a description of behavior, genetics, and environmental influences when appropriate, imaging correlates, and treatments. In addition, ERP assessment is discussed and, as in previous chapters, current research is presented. The section is concluded with chapters on methods of neurotherapy—but again, the subheadings are so comprehensive that they could also be a stand-alone piece that most readers would consider educational.

One unique feature of this book is that it comes with software that provides access to

files via the publisher’s Web site, which allow the reader to practice both the conventional methods Dr. Kropotov refers to and the new methods of QEEG/ERP analysis. The reviewer had some initial difficulty loading the databases, as they were not exactly as described in the text. However, persistence paid off, and once up and running, the exercises worked as intended.

After completing these exercises, readers may find themselves better able to understand the possibilities of current technology and the processing of EEG. For the newcomer to the concepts of ERP, the results of the analysis, although interesting, may require rereading the text for a full understanding of what the resultant maps portray. The software is an attractive feature of the book, because Dr. Kropotov *teaches* the reader. Persevering through the tasks results in a much deeper understanding of the principals outlined in the text.

Many in the field of EEG biofeedback are in the field to help people and to alleviate symptoms, and many are also drawn to the science with a fascination for how the brain works, that we keep learning and asking questions to further our own knowledge—for both groups, the text is well worth a reader’s time. The author does an outstanding job of presenting complicated issues of brain function. *Quantitative EEG, Event-Related Potentials and Neurotherapy* is a must-read for those who wish to further their understanding of the brain with an in-depth exploration of physiology and EEG. Dr. Kropotov has taken every opportunity to educate his readers with a truly comprehensive piece of literature and consequently, and his book should have a place on the “favorites” shelf in every library. This reviewer eagerly awaits Volume 2!

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