BOOK REVIEW

Book Review of *Foundations of Heart Rate Variability Biofeedback: A Book of Readings*

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**Introduction**

The book *Foundations of Heart Rate Variability Biofeedback: A Book of Readings*, edited by Donald Moss and Fredric Shaffer, is an excellent collection of valuable articles relating to heart rate variability biofeedback (HRVB) demonstrating the advantages of self-regulation and the resulting impact of autonomic dysregulation on human functioning. The book readings highlight both the many leading authors in the field of heart rate variability (HRV)—published between 2008 and 2015—and the knowledge base that has developed related to a broad range of applications with promising therapeutic effects from asthma, depression, hypertension, fibromyalgia, to posttraumatic stress disorder (PTSD). The content is divided into four sections: Section 1: History and Foundations; Section 2: Basic Science and Technology; Section 3: Applications; and Section 4: Professional Issues.

In Section 1 (History and Foundations), Paul Lehrer reviews the history of HRV and identifies the pioneers in the field and the emergence of HRV, first as a measure of psychophysiology and medical research and then as a modality in biofeedback practice. In Chapter 2, the authors (Lehrer, Vaschillo, Zucker, Graves, Katsamanis, Velez, & Wamboldt) share their five-visit protocol for HRV training using resonance frequency detection and an education program. In Chapter 3, Richard Gevirtz outlines HRVB evidenced-based applications, which highlights the efficacy of HRVB with many selected disorders. Lastly, in Chapter 4, Paul Lehrer and Evgeny Vaschillo discuss the future of HRVB as it relates to HRV resonance systems for heart rate (0.1 Hz) and blood pressure (0.05 Hz). Their research suggests that augmenting HRV, or creating maximal oscillations in heart rate at the individual’s resonant frequency, may benefit a number of clinical populations including asthma, hyperventilation syndrome, hypertension, hypotension, anxiety, depression, fatigue, and pain management.

In Section 2 (Basic Science & Technology), Chapter 5 (“Heart Rate Variability Anatomy and Physiology”), Fredric Shaffer and John Verner do a nice job of reviewing the anatomy and physiology of biofeedback using both time domain and frequency spectrum examples for the measurement of HRV. Andre Aubert and Bart Verheyden bridge the gap in discussing the heart-brain relationship from a neurocardiology perspective. Artifact correction is always an issue in biofeedback, and Fredric Shaffer and Didier Combatalade give simple guidelines to ensure we get cleaner HRV recordings and signals in this process. In Chapter 8, Paul Lehrer outlines the origins of HRVB, the physiology of respiratory sinus arrhythmia, the baroreflexes, and mechanisms for clinical usefulness of HRVB for blood pressure and chronic heart failure, to name a few. To conclude Section 2, Chris Gilbert highlights the usefulness of pulse oximetry breathing at varying saturation levels using real-life scenarios and suggests interventions with athletes doing altitude training, pilot monitoring, and behavioral rehabilitation protocols such as with patients with chronic obstructive pulmonary disease maintaining 90% saturation levels or above—what he describes as biofeedback-in-action protocols to enhance outcome efficacy.

In Section 3 (Applications), Chapter 11 (“PsychophysioLogic Remodeling of the Failing Human Heart”), authors from the Cleveland Clinic (Christine Moravec and Michael
McKee) describe a biofeedback training program for patients with end-stage heart failure to remodel the autonomic nervous system in lieu of being treated with beta-adrenergic–blocking drugs. Moreover, in the ensuing chapter, Richard Gevirtz discusses survival rates applying HRVB with cardiac rehabilitation populations, by tipping the balance away from sympathetic dominance toward improving cardiac function by stimulating the parasympathetic nervous system and suggesting multimodal integration of treatments (e.g., pharmacology, electrical devices, and biofeedback) to improve the quality of life of cardiac patients. In the following Chapter 12, Maria Katsamanis outlines the efficacy of using HRVB for treatment of major depression, which showed symptom reduction with minimal to no noxious side effects while enhancing patient perceptions of control. Subsequently, in Chapter 13, Gevirtz and Dalenberg suggest HRVB as treatment for trauma symptoms along with cognitive behavioral techniques in the treatment of PTSD, using some form of interoceptive body-oriented therapies. The authors present a case study and suggest more research is needed in this area. In a similar reading in Chapter 14, the authors (Tan, Wang, & Ginsberg) suggest that PTSD points to autonomic dysregulation because of the elevated sympathetic response and the attenuated parasympathetic response. The authors suggest combining HRVB with cognitive behavioral therapy, prolonged exposure therapy, and acceptance commitment therapy to improve the efficacy of PTSD treatment while continued research is needed to confirm their efficacy. In Chapter 15, the authors (Lagos, Bottiglieri, Vaschillo, & Vaschillo) discuss the need to restore autonomic balance for patients with refractory postconcussion syndrome (PCS) and cerebral autoregulation. In the subsequent article in Chapter 16, the authors (Lagos, Thompson, & Vaschillo) followed the 10-week protocol (Lehrer, Vaschillo, & Vaschillo, 2000) of HRVB demonstrating significant improvements in total mood disturbance, postconcussion symptoms, and headache severity. The results in both these articles suggest that HRVB may be a useful adjunctive treatment for PCS, associated with increases in HRV and enhanced cardiovagal activity. In Chapter 17, the authors (Thompson, Thompson, & Reid-Chung) outline a PCS protocol combining Loretta Z-score neurofeedback with HRVB. The authors posit the advantage of this methodology is that in combination, a 19-channel quantitative electroencephalogram, HRV baseline, and symptom severity questionnaire provide a comprehensive assessment of brain activation deficits and as a result may target precise neurofeedback treatment. In addition, Leah Lagos outlines a case study using virtual reality–assisted HRVB to improve golf performance. Using the 10-week protocol (Lehrer et al., 2000), the study demonstrated not only increased performance but also increases in low frequency (LF) HRV, total HRV, and reduced symptoms of anxiety and sensation seeking. The study suggests that positive results can be seen as early as the fourth week during the 10-week intervention. Finally, in Chapter 19, Rollin McCraty outlines an approach to stress management and wellness that emphasizes identifying negative and draining emotions and replacing them with positive emotions. The HeartMath model introduces heart-based, emotion-focused strategies as an adjunctive intervention restoring physiological coherence and supporting emotional regulation.

Section 4 addresses Professional Issues. In Chapter 20 (“BCIA Launches a Heart Rate Variability Biofeedback Certificate of Completion”), the authors (Shaffer, Crawford, & Moss) outline Biofeedback Certification International Alliance’s (BCIA’s) newly developed education and training standards for HRV certification. Having personally followed the BCIA’s Blueprint of Knowledge program with the didactic HRVB courses has allowed me to confidently deliver and integrate HRV with my Olympic athletes and teach the program to my fellow professionals in sport psychology. In addition, I encourage graduate programs to model the programs already established at institutions such as Truman State University to deliver this certification program as part of their curriculum. Finally, in the last chapter (Chapter 21), Dave Hagedorn discusses the importance of mitigating the risk of infection and suggests standards of practice for biofeedback providers.

**Summary**

I strongly recommend this book for all practitioners of Biofeedback, not only for your library but also as a reference on the latest research and best practices relating to HRVB. Reading this book, I reflected that it would have been useful to have all this knowledge in my hands before starting on my quest for BCIA HRV certification.

I highly recommend this book for all professionals in the field of biofeedback, neurofeedback, and those wanting to specialize in HRV certification for specific populations such as rehabilitation and for sport, executive, and military performance.

**References**

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