FROM THE EDITOR

Advances in Neurofeedback and Quantitative Electroencephalography

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The cover of this issue shows the Brodmann areas of the human cortex, as defined by the German neurologist Korbinian Brodmann. This special issue is dedicated to advances in neurofeedback and quantitative electroencephalography (QEEG).

Professional Issues

An article by Fred Shaffer, Randy Neblett, and Judy Crawford addresses current developments at the Biofeedback Certification Institute of America, especially a new program for certifying academicians and biofeedback technicians. Academic certification is designed for professionals who use biofeedback and/or neurofeedback in educational, research, or supervisory settings and who do not treat medical/psychological disorders. Technician-level certification is intended for individuals who treat medical/psychological disorders under a supervisor’s license and lack a clinical degree.

Special Issue Articles: Advances in Neurofeedback and QEEG

An article by Sebern Fisher, “Arousal and Identity: Thoughts on Neurofeedback in Treatment of Developmental Trauma,” addresses the problem of developmental trauma. Developmental trauma refers to the disturbed development of infants and children suffering abuse, neglect, and impaired bonding during the critical period when cortical function should evolve and organize. The result is dysregulated brain rhythms, disrupted interpersonal rhythms, and dysregulated emotional rhythms. Fisher describes the consequences of developmental trauma for cortical rhythms and introduces her approach using neurofeedback to restore the disrupted cortical rhythms and emotional/interpersonal rhythms.

An article by David Kaiser, “Cortical Cartography,” reviews the process by which science has mapped the human brain. He begins with Brodmann, who in 1909 identified dozens of areas in the human and primate brain, based on cell types and distributions, and ends with the LORETA (low-resolution brain electromagnetic tomography) of Pascual-Marqui, which relies on thousands of voxels or sources distributed evenly across the brain. Kaiser also introduces the reader to his own clinical approach, which uses neurofeedback of the larger Brodmann area, each of which also has some functional specificity.

Finally, Kirtley Thornton and Dennis Carmody report on a research study they conducted, “Depression, Love, Happiness, and the QEEG in a Single Case Study,” using QEEG to identify varying brain activation in the emotional states of love, joy, and depression. Their research participant evoked a specific emotional state and self-rated the intensity of emotional experience. A common activation—of the Beta2 (32–64 Hz) frequency range—was noted for all emotional states, but they reported a specific activation of the left hemisphere and temporal love for happiness and of the right hemisphere for depression.

Feature Articles

A useful article by Fred Shaffer, Erik Peper, and I-Mei Lin, “Garbage In; Garbage Out—Identify Blood Volume Pulse (BVP) Artifacts Before Analyzing and Interpreting BVP, Blood Volume Pulse Amplitude, and Heart Rate/Respiratory Sinus Arrhythmia Data,” examines the blood volume pulse signal, commonly used to measure heart rate, heart rate variability, and peripheral blood flow. The authors identify common sources of signal contamination and recommend practical precautions and treatment of artifacts. For example, they show that unless one carefully excludes artifactual signals, the overall descriptive statistics derived from the signal can be seriously compromised. Movement artifact, for example, will produce an elevation in the reported mean heart rate. Similarly, periods with no signal, which may be produced by cold hands or movement, can result in incorrect conclusions about the amplitude of blood volume pulse.

An article by Alice Inman describes “The Cancer Journey” as a pathway with some common phases and adaptive challenges. She conceptualizes cancer as a chronic illness and points out that today, the majority of individuals with cancer survive at least 5 years. Attention to the patients’ experiences and the physical, cognitive, and
emotional challenges that cancer presents at each stage is helpful for any professional practicing in the health sector. Finally, Inman describes applications of biofeedback with cancer patients.

The final article, by Myron Thurber, Eugenia Bodenhamer-Davis, Mark Johnson, Kris Chesky, and Cynthia Chandler, reports on their application of heart rate variability (HRV) biofeedback, along with emotional management techniques, to assist musicians with music performance anxiety (MPA). MPA is estimated to affect between 16% and 72% of performing musicians. Thurber and his associates used emotional management techniques to address the cognitive component of MPA, HRV biofeedback training to address the psychophysiological components, and visualization and rehearsal to address the cognitive behavioral components of MPA. Comparisons of their treatment group and their control group indicated statistically and clinically significant improvements in MPA, using a relatively quick and inexpensive HRV training intervention.

Proposal and Abstracts
Authors are invited to submit manuscripts on any topic in applied psychophysiology and biofeedback. Articles are welcome presently for special issues on Advances in the Use of Surface Electromyography for summer 2010, a Neal Miller Memorial Issue for fall 2010, and The Psychophysiology of Yoga, Meditation, and Spiritual Practices for spring 2011. Proposals and abstracts are also invited for additional topics for future special issues of Biofeedback.