The Internalization of Neurofeedback Training as Demonstrated by Repeated QEEGs

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In general, neurofeedback training can be described as the process of using high-tech computer equipment to measure the electrical patterns of the brain (brainwaves) and then provide instantaneous feedback about those patterns for the purpose of enabling an individual to gain some level of influence or cognitive control over them (Hammond, 2011). Neurofeedback is literally utilizing the principles of operant conditioning to retrain the brain towards a more efficient and desirable mode of performance. In essence it is a process of self-remediation of unwanted activity in the brain. Typically changes in brainwave patterns occur gradually over time and with frequent rehearsal the changes become more enduring.

According to this conceptualization of the neurofeedback process, the first objective would be to learn the new, more desirable pattern of brainwave responses through a process of trial and error by relying on the feedback (audio and/or visual) for guidance. Once the individual has learned the intended brainwave pattern, it then becomes a matter of repetition of that pattern so that it may be properly "imprinted" in the brain in order to have some lasting result. Somewhere between the learning phase and the rehearsal phase, it can hypothesized that there is an internalization of the intended brainwave pattern by the individual in training and that they could learn to produce this pattern, at will, even without the aid of the feedback. It would then be reasonable to assume that the repetition of this newly internalized pattern would have increasingly more and more influence over the resting brain that was not actively engaged in the neurofeedback training process at the time thereby indicating a lasting effect of a reconditioned brain.

The purpose of this presentation is to provide empirical evidence of the internalization and remediation process that occurs during the course of neurofeedback training and treatment. Using multiple case examples of Quantitative Electroencephalography (QEEG) analysis, this process can be illustrated in stages as they occur, providing a vivid cross-section of the changing brain showing both the internalization of normalized EEG patterns and the global improvements that occur along the way as compared to the resting state baseline QEEG measures. The clinical data presented will serve to negate any possible influence of the placebo effect as well as other therapeutic implications for accelerating treatment regimens and increasing efficacy of therapeutic outcomes from neurofeedback training.