

## Training the **Psychedelic Brain**



Langdon Roberts, M.A. C.M.T.  
 langdon@neuromassage.com  
 www.santacruzbiofeedback.com  
 www.inneractive.org

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OUR CAPACITY to intentionally choose our states of consciousness is about to expand dramatically, due to recent advances in biofeedback and neurofeedback technology. This technology has the capacity to rapidly train users to improve focus, reduce anxiety, elevate mood, or enhance meditation. It can also train us to produce some of the experiences commonly associated with psychedelic states, such as an expansive feeling of oneness, synesthesia, or travel outside of the body. Companies like NeuroSky and Emotiv have spent millions of dollars to develop the next generation of EEG devices, which are designed to be inexpensive and user-friendly enough to allow just about anyone to use biofeedback to control video games with their brain-wave activity. While biofeedback has been around for decades, recent advances in computer capacity, combined with advances in the understanding of the relationship between physiology and experience, have made biofeedback a tool that just about anyone can use to achieve a dramatically enhanced state of awareness and an overall improvement in quality of life. It can frequently produce results in just a few months that are as powerful as those achieved through many years of meditation, psychotherapy, or other mind-enhancing practices.

The concept of biofeedback games is very simple. The games are programmed to perform better when the player maintains a desired level of physiological activity, such as brain-waves, heart-rate patterns or muscle tension. For example, the speed of a spaceship might be controlled by reducing muscle activity in the forehead. Success in the game serves as a reward, which trains us to continue to do whatever we were doing when the reward was given, whether it is relaxing muscles, or producing a healthy brainwave pattern. It doesn't matter whether we are consciously aware of what we were doing or not. The biochemical mechanisms of learning function unconsciously. Neu-

rotransmitters are released during reward, which strengthen the connections within whatever neural networks are active at the moment. This type of learning is similar to what most of us experienced while learning to ride a bicycle. After falling off a few times, we suddenly could stay up for a while. Then gradually it got easier, until pretty soon we no longer fell down. We can't describe exactly what or how we were learning. We just learned. The same is true for learning through biofeedback. It doesn't require "knowing how," just interest, motivation and practice.

If this technology was used effectively and responsibly, it may produce a large leap in global consciousness. If biofeedback and psychedelic technologies were to be skillfully integrated into well-designed consciousness training programs, the synergistic effects might be powerful far beyond our current expectations of what is possible. Imagine having access at-will to the intuitive, creative, and expansive experience of psychedelic states and the stillness and peace of deep meditation, while remaining lucid and interacting effectively in the everyday world. Not only is it possible for this ability to be achieved by millions of people within the next decade or two, it may be necessary. It is, in my opinion, unlikely that the emotional, mental and spiritual level of development currently achieved by even the top one percent of humanity is sufficient to produce the physical and social technologies that we will need to create very soon in order to sustain the human race. It is fortunate that the capacity to transform a substantial number of us into Einstein-Buddhas is just around the corner.

While this might sound like a premise for a fantasy Sci-Fi novel, I assure you that the hardware and software capacities for this revolution already exist, and that some of the essential groundbreaking research has already been done. For example, by the late 1970's, C. Maxwell Cade had discovered a signature pattern of electrical activity in the cerebral cortex

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of skilled meditators, which he called the awakened mind pattern. This pattern, which is frequently seen during periods of enhanced awareness, is a laterally symmetrical and focused activation of alpha waves (mid-frequency) and theta waves (low frequency). Some variations of this pattern also include beta (fast) and Delta (very slow) waves. Learning to maintain the awakened mind pattern, through intentional meditative practice, or by other means, helps us to access states of inner peace and gain access to our higher wisdom, as well as increase our capacity for creativity and compassion. In my own biofeedback practice, I have observed many clients producing some variation of this pattern. I have seen this pattern associated with experiences of out of body travel, synesthesia, deep stillness, Shamanic healing trance, communication with Spirit Guides, or self-described “psychedelic states”.

Perhaps the most dramatic finding in the study of EEG activity in psychedelic states was the discovery by Frank Echenhofer and David Stuckey that coherent high frequency brain activity within the gamma spectrum is substantially increased during ayahuasca use. Gamma coherence is thought to be associated with increased cortical processing, attention and information binding. Richard Davidson and his colleagues found that gamma coherence was also elevated in skilled meditators during practice. Meditation leads to improved physical and emotional health, and it improves cognition. In my own practice of enhancing gamma coherence through biofeedback, I have noticed an improvement in attention, sensory awareness and information processing.

This correlation between psychedelic and meditative physiology might be the first physical evidence of what many of us know experientially; that at the heart of the psychedelic experience, there is a still, yet intense awareness, which is not very different in essence from the aware-

ness that we can experience during deep meditation, connection with a loved one or with nature, ecstatic dance, complete immersion in the creative process, or during those moments which sometimes come to nearly all of us, when we spontaneously feel a connection to and appreciation of the fullness of life. This awareness comes in many “flavors,” which might be described as immersion in visions, physical ecstasy, or bathing in profound peace.

My clients and I frequently attain these states intentionally through biofeedback, and sometimes maintain the core awareness for prolonged periods, even during challenging circumstances in the everyday world. The most effective protocols for attaining these states vary among individuals, and the specific flavor of state enhancement is still not very predictable, yet there is a high degree of consistency in the physiology that I see when one of these states, which I refer to as states of “engaged stillness,” is achieved.

The EEG generally shows reasonably high alpha and gamma coherence, and either some variety of the awakened mind pattern or a pattern of intense activity usually peaking within the alpha band, and dropping off toward both higher and lower frequencies. This alternate pattern is usually associated with bliss states. In addition to the EEG patterns, a person who is fully in a state of engaged stillness usually has a high level of heart coherence, which reflects the synchronization of the heart rate with the breath, and low levels of muscle tension in the head, neck and shoulders. Personally, I have learned to fairly consistently create a state which is nearly indistinguishable from an MDMA experience. While everyone’s response is different, I have yet to see anyone with all of these simultaneous physiological patterns who is not experiencing a state of heightened presence.

In addition to creating elements of psychedelic states with biofeedback, it is also possible to use this technology to inten-

tionally guide the direction of a psychedelic or other drug experience. Recently, I trained myself to alter my own response to caffeine, through a simple process of drinking coffee while increasing heart coherence and reducing my galvanic skin response, which is related to sweat production. During graduate school, I developed a strong reactivity to caffeine, due to overuse. The response included shaking, an uncomfortable buzzing feeling in my head, and intestinal cramping. After a single session of biofeedback, I was able to retain the heightened sense of being awake and focused from the caffeine, yet without the negative side effects. Much of the effect has stayed with me now for many months. Although the physiology of psychedelic states is much more variable than that of a drug like caffeine, is likely that we could use this basic strategy to train ourselves to eliminate negative aspects of psychedelic use or enhance positive ones.

We might also be able to dramatically increase the amount of information which we can carry back with us from the vast stores of information available to us from the subconscious and other realms while using psychedelics. One strategy that could be used is similar to the process of learning to retain more from deep trance states by creating what we call an “alpha bridge.” The alpha bridge is simply a strong, steady alpha rhythm, which facilitates the transfer of information between the waking mind, which contains substantial beta activity, and the lucid dream state, which is dominated by theta. Although the research on alpha activity during psychedelic states currently gives us an unclear picture, it is likely that a biofeedback protocol that produces increased sensory awareness and clarity, such as enhancing focused alpha activity around the 10 Hz. frequency, might serve to create a bridge from ordinary to

psychedelic consciousness, as it does with other non-ordinary states.

I believe that in order to create the society that we truly desire and deserve, and that will allow for the survival of our species (as well as many others), it will be necessary for hundreds of millions of us to learn to use these advanced technologies, and live in these states of engaged stillness within the next decade or so. While this seems like an impossibly tall order, we already have much of the knowledge that would allow for this massive shift in consciousness to occur. We could probably learn enough, with a few years of intense research, to understand how to reliably and efficiently help people to achieve and maintain higher states of awareness, with or without the use of psychedelics. It would then be possible to create a viable system for training huge numbers of people, through freely available software over the internet, and sensors that would be affordable for just about everyone.

I have recently taken over management of a nonprofit organization, the Inner Active Health Project, which aims to substantially facilitate this process. Our goal is to gather information from scientific studies, biofeedback practitioners, and experienced consciousness explorers of all varieties about the relationship between easily-measured physiology and non-ordinary states of consciousness. We will then create software that is capable of monitoring and skillfully guiding users of biofeedback video games toward the most highly evolved states of being that are within our realm of understanding. In cooperation with researchers, game developers, psychedelic enthusiasts, and other visionary supporters, it seems likely that we can reach critical mass in consciousness in time to help guide humanity toward a truly sustainable and joyful future.

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