

Neurofeedback, Growth, and Habit

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Abstract

I describe a holistic approach to changing addictive behaviors based on neurofeedback with elements common to the therapies of indigenous cultures.

What Is Normal?

“Your relationship to your psyche is like an addiction. It is constantly making demands of you, and you have devoted your life to serving those needs.”¹

— Michael A. Singer

We focus on learning about things, and we’re not accustomed to considering ourselves as things that need learning about. We’re taught to recognize problems and seek solutions, not examine how we recognize, or what it is to seek. We take these processes for granted and assume they take care of themselves.

Autonomic processes, like breathing, seeing, and hearing, are supposed to take care of themselves. Yet if you examine these processes you’ll find we habitually over breathe — raising blood alkalinity and depressing oxygenation² — misuse our visual system — resulting in restricted awareness, dulled perception, repressed emotion and degenerative vision³ — and fail to listen as a conscious, active process — resulting in deficient hearing, speaking, reading, and communication⁴. Even our heart’s rhythm may require our attention to achieve healthy variability⁵, not to mention the function of our bones, joints, and vascular systems, which also require participation.

So it should come as no surprise that using our brains, and the myriad processes this involves, requires attention lest these processes fail to grow or maintain. Yet we have little awareness and practically no training in exploring, sensitizing, exercising, and expanding our neural capacities.

Add to this the list of processes over which we exert conscious control and struggle to manage, such as eating, sleeping, moving, and planning our lives, and the workload

¹ Michael A. Singer, [The Untethered Soul: the Journey Beyond Yourself](#) (New Harbinger, 2007) 93.

² Teresa Hale, [Breathing Free: The 5-day Breathing Programme That Can Change Your Life](#) (Hodder Mobius, 2001), and Peter M. Litchfield, Ph.D., “Good Breathing, Bad Breathing,” May 2006, at <http://bp.edu/Good and Bad Breathing.pdf>

³ Jacob Liberman, [Take Off Your Glasses and See](#) (Three Rivers Press, 1995).

⁴ Alfred A. Tomatis, [The Conscious Ear: My Life of Transformation Through Listening](#) (Station Hill Press, 1992).

⁵ Doc Childre, Deborah Rozman, [Transforming Depression: The HeartMath Solution to Feeling Overwhelmed, Sad, and Stressed](#) (New Harbinger Publications, 2007).

becomes overwhelming. In the end we consider personal growth to be a luxury. It is no wonder that we are fall apart as we age, and that our societies do too.

You cannot consciously monitor every process, system, and function in your body, but you are aware and do monitor them semi-consciously. Maintaining and enhancing your health is not accomplished by juggling more balls, but by juggling less. Use your attention to train these semi-autonomic systems — your senses, metabolism, and cognition — and they will take care of themselves, like the skilled managers they are.

To enhance your life you need a deeper awareness of self, not just of your conscious mind and emotions. And you certainly don't need more facts. With awareness you can develop the acuity to sense and rebalance all the systems of which you are composed. It is not a conscious activity, but it is not an entirely unconscious one either. It exists in that middle realm of the subconscious, in which also resides spirit, love, insight, inspiration, healing, ancestry and culture.

The Person

How far does a person extend in time? The forces that form one's personality extend over generations with trauma passed down through the actions of parents, and though social context. A person's strengths and weaknesses are a summation of their individual and cultural conditions. You cannot isolate a person from their culture, even those who are unaware that they are influenced by their culture.

Of how many parts is a person composed? Our emotions, inclinations, and presentations turn like gears in the clockwork of our personalities. Some of one's guiding voices are quiet, even unrecognized, yet they vie for control of the one person who most of us think we are. This illusion of integrity breaks down under duress where confusion is more a matter of dissociation than of indecision. Who comes for therapy, what parts of them do not come, and what constitutes reintegration? As a therapist are you even speaking to the right characters?

It is a mistake to think that you, as one person interacting with another, are speaking with one voice. You speak with many voices, some of which you are unaware. These elements of your personal, family, and cultural character simultaneously interact with similar elements in the character of others. Some of these voices reflect habits and assumptions of which we are unconscious, and many we could not recognize even if they were pointed out to us. They range from spirits, to moods, traits and aptitudes, and while they are not cataloged, some have electrical signatures that we glimpse in the EEG brain waves.

Therapy is a growth and learning-oriented dialog that goes on within the mind of the person seeking growth and between their mind and the minds of those around them. Therapy strives for physical change, both within the body and in the environment, but the changing of minds is where it must begin. The critical changes occur in the seeker's mind, but you can instigate change if you can change your mind in such a way as to make clear the seeker's path. To do this you must grow yourself.

Feedback

Enhancing your sensitivity and balance is the first of two goals of feedback training. Think of yourself as a smart car that is able to adjust its' own suspension. When the road is rough the car raises its chassis and dampens its springs to ride over rocks and ruts with less vibration and more control. When the road is smooth the suspensions tightens and lowers for greater speed and sensitivity. This system interacts with its environment, and to do this successfully it must sense and respond to changes in the surface of the road ahead.

You are an interactive system but you are not a smart car, you are more like a poorly trained smart car. Where a smart car always responds, you do not. Sometimes you go too slowly on patches of smooth road letting your emotions oscillate when you should be focusing at a distance. At other times you're going too fast when your life hits a rough spot and you'll be lucky to escape with only a dent. The key to making you a smarter car is the improvement of your sensitivity and your ability to change.

The second goal of feedback training is developing new habits, and this is not so much an intervention as it is a natural human ability. We are creatures of habit and live most of our lives on autopilot. Most of what we call "free will" is little more than a collection of learned behaviors.⁶

Autopilot is the artificial brain that allows the smart car to take care of itself. Autopilot is good when it works and leaves us with less to do, and with more room to think. Humans subconsciously develop and refine their autopilot functions, but they can only succeed to the extent that they're sensitive and able to adjust. The first part of feedback training serves to make a person more sensitive and flexible, the second part of feedback training relies on each person's subconscious ability to turn new responses into habit.

Addiction

*"In a time of peace the warlike person attacks himself."*⁷
— Friedrich Nietzsche

Addiction is autopilot gone awry, and since we are all creatures of habit, we all have the potential for addictive behavior. In truth we're already addicted to our habits, and none of our autopilot functions work perfectly. The autopilot functions in many "healthy people" actually work pretty badly, but we've learned to cope and what dysfunctions remain we label as disease. It's only when our dysfunctions become socially disruptive and take on specific characters that we assign the label of addiction. We all lie somewhere on the addiction spectrum.

Addiction becomes a problem when it appears to fail as a behavior strategy. I say "appears" because internal forces continue to support it. Without their support it would stop. The negative view of addiction assumes that by removing the addiction a better person can emerge. The truth of this depends on a balance of forces. Removing the

⁶ Daniel M. Wegner, [The Illusion of Conscious Will](#) (Bradford Press, 2002).

⁷ Friedrich Nietzsche, [Beyond Good and Evil](#), Part 4, #76

addiction without resolving its cause is only to suppress it and a troubled person will emerge: unstable, neurotic, or depressed.

Addiction is not a behavior of the intentional sort, it's a response to forces unrecognized and unmanaged. Addiction persists because it plays an important role in the life of the person who has chosen to be addicted.

The importance of an addiction can be measured by the damage that it causes. The addicted person is choosing the enemy that they know, rather than the enemy that they don't. This choice is not wholly conscious, and replacing it must involve processes that are not wholly conscious. Changing behavior involves subconscious processes.

Neurofeedback

*"The only permanent solution to your problems is to go inside and to let go of the part of you that seems to have so many problems with reality."*⁸

— Michael A. Singer

Neurofeedback is being used as a therapy for a wide range and growing number of clinical conditions.⁹ It has the simple goal of making one more sensitive and flexible in developing one's aptitudes and expressing one's inner personalities.

Neurofeedback works because the mind is self-healing when it is not obstructed. Once one becomes deeply familiar and relaxed with alternative mental states, most of which are not conscious states, then other mental states can begin to replace dysfunctional states. How this happens remains a mystery, but by providing feedback to the brain we can facilitate its occurrence.

Mental States

The notion of "mental states" is not well defined and their origin is not well understood. But you don't need a theoretical understanding of mental states if you appreciate their effects on health, and have a means to direct them. The same is true with the body's natural healing abilities: you don't need to know how they work in order to facilitate them.

If you do not understand how mental states work in the healing process, then you should only facilitate and not intervene. This assumption of a facilitating role, of listening and helping rather than judging and controlling, is a critical distinction between the homeostatic approach of neurofeedback and allopathic Western approach.

The following description of neurofeedback illustrates that "hands off" is the most sensible approach. This aims to remove your need to understand and your desire to interfere that place obstacles in the way of the healing process.

⁸ Singer, op. cit., p. 16.

⁹ A compilation of references to work published up to 2004 on the application of neurofeedback to a various medical conditions can be downloaded at:
<http://www.californiabrainworks.com/articles/NeurofeedbackMedicalLiterature.pdf>
The International Society for Neurofeedback Research offers a bibliography at
<http://www.isnr.org/ComprehensiveBibliography.cfm>

We change our mental state frequently, and we usually consider our mental state a consequence of outside influences, everything from our automobiles to the planets in the zodiac. The degree to which we don't take responsibility for our state of mind is odd considering how much we extol our free will. Part of the explanation for this is that we just don't know how to regulate ourselves, and this is where neurofeedback comes in.

Many of the states that we explore through neurofeedback are the same states we encounter in daily life. In addition neurofeedback invokes subconscious and intermediate states. Let's explore what this means.

Filters

We use our mental states as filters to interpret the world, much as an eye chooses to seek and focus on an image. We have an experience that sets our mood or state, but it is more accurate to say that we call up a mood or state in order to interact with our environment in the manner that has become our habit.

Our mental state is involved with processing the world. That is to say our mental state plays a role in the conversion of perception to conception, to understanding, to action and reaction. The brain is involved at each step through processes of which we are only vaguely aware. These intermediary processes can range from being well regulated to being poorly regulated.

Here is an example of filtering and reinterpretation from the field of statistical data analysis. The first of following two images is a photograph of a car's license plate blurred by motion. The second image is the same photograph after it's been digitally analyzed.

The process of digital analysis uses assumptions of how noise and distortion appear in photographic images, but has no information about this particular image or the subject in the image. The clarity of the plate number is impressive, but notice the emergence of details of which there was no hint in the original. Our minds work in a similar manner to interpret what we perceive, only our mind has more layers, and applies more assumptions.

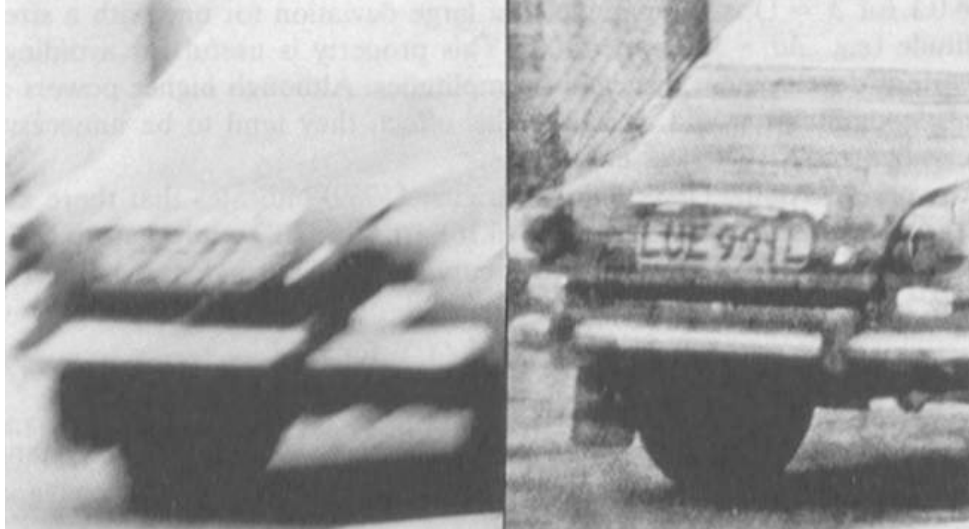


Figure I. Bayesian analysis and resolution of a blurred photographic image.¹⁰

When we let the brain “watch” itself, rather than watch things outside of itself, the brain gains a new level of control. Lacking feedback is like trying to learn how to ride a bicycle on a dark, moonless night: you can’t because you don’t know where you are or the effects of your actions. Neurofeedback turns on a light so that your mind can see what it’s doing. 30 years of research has shown that it is quite easy for us to consciously change our brainwaves as well as increase our brain’s activity by being more aware of our own thinking processes.¹¹

Consider these examples of normal changes in states of mind. Most people require some trigger to make these changes of state.

- You awake from a restful sleep and in your foggy consciousness you are relaxed with the world. You are not concerned with the day’s schedule. You feel neither anxious nor worried. This is a low arousal state of mind.
- After work on Friday you go to the beach. You take off your shoes to walk through the cool sand. The crisp air is rafted with broken clouds. Your mind is empty, clear, and at peace. You have an attentive and balanced state of mind.
- On a late drive home you glance at the speedometer, close your eyes for a moment, and lurch awake just before driving onto the shoulder. Attentive and fearful thoughts of what might have happened rush in and then drift away. You are left in a hyper-aroused state.
- Listening to live music you’re flooded with a warm memory of childhood and your parents. In a receptive emotional state you feel a little sad, a little vulnerable. You are in an emotionally receptive state of mind.

¹⁰ From S. F. Gull and J. Skilling, “Maximum Entropy Image Reconstruction,” in *IEE Proceedings*, v131F (1984), pp. 646-659.

¹¹ Kai J. Miller, et. al., “Cortical activity during motor execution, motor imagery, and imagery-based online feedback,” in *Proceedings of the National Academy of Sciences*, (in press) DOI: 10.1073/pnas.0913697107, as reported in “Brain-Controlled Cursor Doubles as a Neural Workout,” *Science Daily*, at <http://www.sciencedaily.com/releases/2010/02/100215174206.htm>

- Recall being a teenager and seeing the girl or boy with whom you were interested talking and laughing with another: feelings of entitlement and jealousy, or maybe anger and sadness.

We engage in predominant ways of thinking that limit our insight and flexibility. Some therapies, such as those based on Jung's psychology of types, attempt to enlarge a person's habitual response in order to provide greater insight into the world.¹² We all experience moments of alternate consciousness, but they rarely provide vantage points from which we can see a new world wholly formed.

The existence of different viewpoints is no mystery. These viewpoints precede and guide our consciousness, though we are marginally conscious of them. With practice we can control these modes of thought and control how we react to unexpected forces, rather than the other way around. This kind of control is primarily preconscious and intuitive.

Our mind builds its mental state like a circus family crossing a tightrope riding a pyramid of bicycles. We cannot swap one underlying thought form for another without upsetting the family of mind. And it's because the mind only presents itself as a family that talk therapy has such difficulty in fully exploring alternative points of view. In contrast, there are methods that disassemble this pyramid and enable the mind to explore itself freely, one bicycle at a time, as it were. Two such methods are trance and neurofeedback.

The passive process of neurofeedback encourages you to develop new brainwave patterns without resorting to discussion; you create these new patterns with little conscious reflection. You are simply taught to reset your brainwave patterns and explore the states that arise.

The skill of a neurofeedback therapist lies in guessing which states of mind are the most therapeutic, and bringing them forth. It takes experience to succeed in coaching a client to manifest their mental landscape.

The goal is to develop a set of states that exclude "that part of you that seems to have so many problems with reality." These develop out of the client's own repertoire of states, but involve unfamiliar readjustments, the adjustment to states that they previously had not fully experienced, or which they denied themselves access to because of anxious or traumatic associations. The point is that one can do an end-run around trauma because neurofeedback deals with raw brainwave patterns, and not the thoughts or memories with which they're habitually associated.

For example, if a client is obsessed with guilt or anger, then they will have little success in accommodating a stable, comfortable mental state at the same time they are guilty or angry. And because they cannot explore these comfortable states they cannot become habituated to them. Neurofeedback can lead them around their "issues" into a comfort zone. And once they have learned that they can access this zone without first resolving these issues they gain a new vantage point from which to consider these issues. More likely, the issues become irrelevant.

Neurofeedback enables you to relax, release, become sensitive to, and explore alternative states without engaging disturbing mental states. You might say that

¹² C. G. Jung, Psychological Types (Princeton University Press, NJ, 1981)

neurofeedback enables a person to change horses mid-stream because, for many people, there is no way out of the stream.

The Alpha-Theta Protocol

“The active ingredients in (Alpha-Theta) neurofeedback (include): ... the new experience of physiological/psychological self-control in a situation where the client had previously felt helpless; (and) the apparent experience of ... significant spiritual insight.”¹³

— Matthew Kelley

The Alpha-Theta neurofeedback protocol used for the remediation of addiction was developed by E. Peniston and P.J. Kulkosky in 1989.¹⁴ Six weeks of daily sessions of neurofeedback training involving inpatient “problem drinkers” has repeatedly been shown to result in approximately 85% full or sustained partial remission after three years.¹⁵ This compares with what we might project to be 40% of the participants achieving the same outcome through conventional treatment.¹⁶ I will briefly describe what this therapy entails.

Alpha-Theta, like other neurofeedback protocols, is a form of EEG biofeedback. It’s called “EEG” because the client interacts with their own electroencephalograph. It’s called biofeedback because the client creates, perceives, interacts with, and learns to readjust what they’re simultaneously creating and perceiving.

An EEG is a simple graph of voltages read from one or more points on the scalp. The voltages vary over time and their graph shows an erratic line. Here is a typical EEG graph:

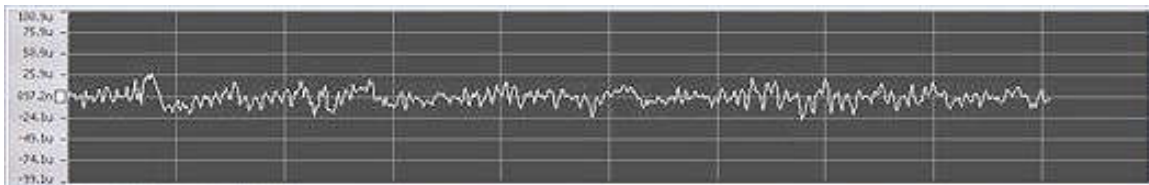


Figure II. EEG graph showing voltage changes over time at a point on the head.

The first step in extracting useful information from the EEG is to decompose this signal into the range of frequencies of which it is composed. This kind of decomposition can be

¹³ Matthew J. Kelley, “Native Americans, Neurofeedback, and Substance Abuse Theory, Three Year Outcome of Alpha/Theta Neurofeedback Training in the Treatment of Problem Drinking among Dine' (Navajo) People” in *J. of Neurotherapy*, v2(3), 1997, pp. 24-60.

¹⁴ E. Peniston & P. J. Kulkosky, “Alpha brain wave training and beta endorphin levels in Alcoholics,” in *Alcoholism: Clinical and Experimental Research*, v13(2).

¹⁵ Matthew J. Kelley, op. cit.

¹⁶ Extrapolating from the 30% full, 45% partial remission reported after 1 year, according to Dr. Mark Willenbring of the National Institute on Alcohol Abuse and Alcoholism, as reported in J. Adler et. al., “Rehab Reality Check,” *Newsweek*, February 2007, v149(8), pp. 44-46, at <http://www.newsweek.com/id/68441/page/1>.

done with any signal of any sort and results in an EEG spectrogram that displays a more structured picture of the brain's activity over time.

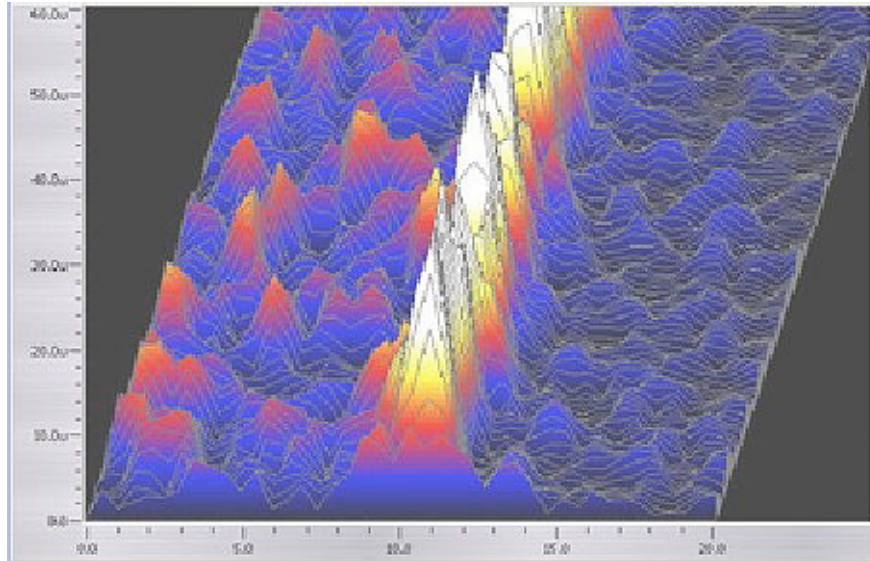


Figure III. EEG spectrogram peaks indicate the main EEG frequencies at 10 Hz.

The spectrogram in Figure III shows electrical activity as peaks and ridges across a range of frequencies from 0 to 20 cycles per second, or Hertz. This is a typical frequency range of interest, but the map that emerges can differ greatly between subjects.

Certain spectrograms are “normal” for a person of a given age and state of mind. In particular, the spectrogram of an alert and focused person will show narrow peaks around 10 Hz. Waves in this range are called alpha waves. The same person in a hypnagogic trance will show a broader ridge formation centered at the lower frequency of 5 Hz. These are known as theta waves.

The Alpha-Theta protocol is based on the observation that we process trauma and achieve reconciliation when we alternate between an alert state and a hypnagogic state. The protocol is conducted by having the client lie comfortably for 45 minutes in a dark room, hooked up to an EEG machine, listening to one or the other of two ambient sound tracks. These two tracks alternate depending on whether the client is generating more alpha waves or more theta waves.

These audio tracks provide feedback that tells the client which of the two states is more strongly present, and the client is encouraged to listen for and relax into a state in which the two sound tracks alternate. The therapist does not interrupt this process.

This protocol involves the therapist directing the client's intentions, as it's important that the client move toward a healing mental state. This can be anything from a generally positive to specifically healing frame of mind. The therapist uses guided imagery to lead the client into this state at the beginning of each training session. This has much in

common with the hypnotherapeutic technique of Rational Emotive Behavior Therapy, already applied in the treatment of addiction.¹⁷

The hypnosis paradigm to “explore preconscious and unconscious functions, resolve historical factors, and utilize unconscious resources”¹⁸ has much in common with neurofeedback. In most cases the fields use different procedures and terminology, but the use of psychoanalytic terms and guided imagery make Alpha-Theta the exception.¹⁹

While hypnotherapy is used to address addiction in a context of other standard therapies, it has a broader purpose when used with neurofeedback. Here the aim is to two-fold. First, along the standard lines it works to resolve the embedded trauma and conditioned responses typically associated with addiction. In addition, it contributes to the process of resynchronizing a wide range of brain functions including attention, arousal, sensitivity, emotional balance, cognitive function, and pattern and boundary recognition.

Alpha-Theta neurofeedback “has all the benefits of hypnosis because you’re re-programming your subconscious mind, but with the added feature that hypnosis can’t get to. It clears out the traumatic experiences that have put on the brakes on your ability to progress.”²⁰

— Dr. Daniel Staso

Holistic Therapy

Hypnotically enhanced Alpha-Theta neurofeedback adduces relevant memories and subconscious states, at the same time encouraging an awake state and discouraging anxious and reactive states. There are several ways in which this treatment is similar to traditional healing therapies.

- (1) The therapist’s power is based on trust.
- (2) The therapist puts the client in a sensitive trace state.
- (3) The therapist guides and protects the client.
- (4) The therapist does not know and does not claim to know how to heal the client.
- (5) The client is encouraged not to use their mind, and not to fixate on any issue.
- (6) The therapist remains sensitive to, and remains focused on the client and their process through the long period of non-interaction.
- (7) The therapist is available to provide support in between sessions.

¹⁷ H. B. Jayasinghe, “Hypnosis in the Management of Alcohol Dependence,” in *European Journal of Clinical Hypnosis*, 2006 at [http://www.encognitive.com/files/Hypnosis in the Management of Alcohol Dependence.pdf](http://www.encognitive.com/files/Hypnosis_in_the_Management_of_Alcohol_Dependence.pdf)

¹⁸ D. Corydon Hammond, Ed., *Handbook of Hypnotic Suggestions and Metaphors*, (W.W. Norton, 1990) 3.

¹⁹ An alternate interpretation is that the brains’ of alcoholics produce insufficient alpha and theta frequencies, that alcohol consumption chemically restores this balance, and that Alpha-Theta therapy trains the brain to produce these vibrations without alcohol. See T. M. Sokhadze, R. L. Cannon, D. L. Trudeau, “EEG Biofeedback as a Treatment for Substance Use Disorders: Review, Rating of Efficacy, and Recommendations for Further Research,” in *Appl Psychophysiol Biofeedback* (2008) v33, pp. 1–28.

²⁰ Dan Staso, PhD., “Alpha-Theta Neurofeedback Training,” 2009, at <http://www.danstaso.com/userfiles/232769/file/Alpha-theta.pdf>

Addiction is a holistic disorder involving conscious and subconscious attitudes, central nervous system functions, personal history, social history, and cultural context. Reductionist Western healing rejects integration and thereby fails to provide a holistic approach. The shortcomings of this range from uncoordinated specialists addressing complementary aspects of one's condition — as in the story of the blind men describing the elephant — to entirely missing the whole — wherein the blind men cannot find the elephant. In this case the elephant is one's whole spirit.

Neurofeedback is an integrative therapy that views addiction as requiring a change of one's person difficult to achieve solely through verbal means. Neurofeedback looks within the individual, below the levels of chemistry and personality, addressing the components of perception, regulation, and cognition.²¹ Neurofeedback aims to introduce the client to a person, or people, they do not know. The therapist does not know them either and cannot force the introduction. The therapist functions less as a doctor and more as a doorman.

The Exception of Stimulants

Alpha/Theta relies on a patient's ability to enter into, and benefit from relaxed states. People addicted to stimulants are not attracted to relaxed states and have trouble achieving them. Alpha/Theta is unsuccessful when it is the only neurofeedback therapy used for this group.

The neuropsychological explanation for this is that stimulant addicts display excessive theta waves, and enhancing these signals through Alpha/Theta therapy is counter productive. In addition, these people are observed to show below normal brainwave activity in higher frequencies, which correlates with their presentation of ADD/ADHD-like symptoms.

This mechanistic explanation implies that if normal brainwave conditions can be restored, then people addicted to stimulants will benefit from Alpha/Theta therapy. This has been shown to be true.

In a study by Scott, Othmer, Kaiser, and Sideroff²² stimulant-addicted volunteers from a residential treatment program were trained with 10 to 20 sessions of neurofeedback to generate more normal brainwaves. Training was continued until clients showed normal Test of Variable Attention (TOVA) scores. Thereafter, these clients were given a standard course of 30 Alpha/Theta sessions. Tests one year after the completion of therapy showed that 77% were abstinent. This is on par with the 80% success rate demonstrated for people addicted to alcohol.

Because these results are repeatable it is concluded that this kind of EEG-based normalization enables stimulant addicts to get the full benefit of Alpha/Theta therapy.

²¹ Other approaches to neurofeedback are mechanistic. A popular approach called Z-Score training applies objective standards and a generally impersonal approach.

²² W. C. Scott, et. al., "Effects of an EEG Biofeedback Protocol on a Mixed Substance Abusing Population," in *The American Journal of Drug and Alcohol Abuse*, v 31 (2005), pp. 455- 469.

That is to say, it allows stimulant addicts to achieve the same high abstinence rates as alcoholics.

40% of the Population

Neurofeedback clients are prescreened as suitable for this type of therapy. Some are referred, some are frustrated with alternatives, some like the approach,... and they can financially afford it. Those who elect to continue the treatment either perceive benefit, or are attracted to the approach, or react positively to the therapist. As a result neurofeedback therapy is more effective for the clinical population for which success rates are measured, than it would be on the average population.

The success of any holistic therapy depends on the alignment of many factors and people with dysfunctional lives, coming from disintegrated cultures, are often unprepared for this kind of healing. This does not mean holistic therapies are not beneficial, it means the outcome is hard to predict and may yield slow progress.

The effects of neurofeedback are subtle and some people report no effect after the first treatments. This is partly intentional since a neurofeedback therapist wants to avoid strong stimulation until a client's sensitivity can be assessed. Also, therapeutic effects are dulled by medications, distraction, and tension. In most cases the therapy is considered optional, and people are encouraged to use their own judgment. As a result new clients may discontinue treatment if it fails to meet their expectations even though its long-term effects would benefit them.

In a Houston, Texas study 430 crack cocaine addicts volunteered for 30 neurofeedback treatment sessions at the Open Door Mission, a faith-based, 120-bed drug treatment facility for homeless persons.²³ These people were highly addicted and socially disadvantaged: 65% had been incarcerated, 67% had daily crack use, 86% were undergoing repeat treatment, and 84% were unemployed. The program did not utilize traditional substance abuse treatment modalities such as individual, group and family therapies nor adherence to twelve-step programs. The program did require religious education classes.

In this study 54% dropped out and only 46% of the subjects elected to complete the treatment. 89% of those who finished were assessed one year later as having made significant positive social adjustments and were drug-free. In the similar study by Scott, et. al., that was mentioned above, 54% of the subjects completed treatment and 77% were abstinent after 12 months. Taking a simple average of these two trials as representing the population at large indicates that 50% of the population will be comfortable with neurofeedback, with an 83% success rate within this group. We can infer that neurofeedback "works" about 40% of the time in a general population with this kind of voluntary participation.

²³ V. Burkett, et. al., "An Open Clinical Trial Utilizing Real-Time EEG Operant Conditioning as an Adjunctive Therapy in the Treatment of Crack Cocaine Dependence," in *Journal of Neurotherapy*, v 9(2), 2005, pp. 22-47.

Spirit and Ceremony

Traditional therapies typically create a physically and spiritually protective setting, and establish a positive mindset in the participant. Participants focus on healing intentions before engaging subconscious images and meaningful archetypes. These therapies usually require participation in ceremony, though often in an altered state. And while many ceremonies do not address specific ailments, traditional methods are being successfully used to treat a wide range of chronic medical conditions.²⁴

In addition to these similarities, parallels exist in brain physiology between those undergoing Alpha-Theta neurofeedback and participants in the Amazonian ayahuasca ceremony.²⁵ These similarities are likely shared between neurofeedback and other traditional therapies.

Traditional healing is holistic. When performed in the indigenous context the ayahuasca ceremony aims to heal the body, mind, spirit, family, culture and cosmos. Neurofeedback therapy does not aspire to this level of integration but I believe it can.

“Shamanic cultures view illness and trauma as a problem for the entire community, not just the individual or individuals who manifest the symptoms. Consequently, people in these societies seek healing as much for the good of the whole as for themselves.”²⁶
— Peter A. Levine

Ayahuasca and ibogaine, which come from widely separate traditions, are successfully being used in the remediation of addiction through what can be best described as deep, personal transformation. The 6-month ayahuasca-based program at the Takiwasi Center in Peru has offered substance addiction therapy since 1992 with roughly 70% success in remediation.²⁷

“Ancestral medical practices are based on a highly sophisticated practical knowledge and, in contrast to the clumsiness with which Western peoples induce altered states of consciousness, view the controlled induction of non-ordinary states of consciousness as potentially beneficial, even in the treatment of the modern phenomena of drug addiction.”²⁸
— Dr. Jacques Mabit, Physician and founder of the Takiwasi Center

²⁴ Lewis Mehl-Madrona, “Traditional (Native American) Indian Medicine Treatment of Chronic Illness: Development of an Integrated Program with Conventional American Medicine and Evaluation of Effectiveness”, at <http://www.healing-arts.org/mehl-madrona/mmtraditionalpaper.htm>

²⁵ E. Hoffmann, et. al. “Effects of a Psychedelic, Tropical Tea, Ayahuasca, on the Electroencephalographic (EEG) Activity of the Human Brain During a Shamanistic Ritual,” in *MAPS Bulletin*, v XI(1), pp 25-30, at: <http://www.maps.org/news-letters/v11n1/11125hof.html>.

²⁶ Peter A. Levine, *Waking the Tiger: Healing Trauma* (North Atlantic Books, 1997) 57.

²⁷ J. Mabit, “Blending Traditions: Using Indigenous Medicinal Knowledge to Treat Drug Addiction,” in *Multidisciplinary Association for Psychedelic Studies* (MAPS), v XII(2), pp. 25-32. See also information at <http://www.takiwasi.com>.

²⁸ J. Mabit, op. cit.

Trauma and Alienation

Trauma plays a central role in our lives because fear, and the anxiety it creates, is the glue that fixes our habits. Psychological trauma is recognized, by far, as the major source of spiritual distress.²⁹ Acute trauma is a recognized condition, but this definition is insufficient because “any event or ongoing condition may be considered traumatic if it overwhelms an individual’s ability to cope, rendering them helpless.”³⁰

Historical trauma, developed by Maria Brave Heart and her colleagues, is an integrated description of a condition that underlies a range of chronic ailments. It is an approach that looks outside the individual, and beyond one’s own recollection and genetics as we know it. Historical trauma recognizes that people find meaning through the context of culture and family. And when one’s culture has been traumatized — as in the case of Native Americans — or has been anesthetically amputated — as in the case of the melting pot of Western culture — individuals may lack the internal resources necessary to build a viable identity.

“Studies among the Lakota provide evidence to support generational trauma response features similar to the survivor’s-child complex. Closer examination of suicide studies reveals implicit unresolved, fixated, or anticipatory grief about perceived abandonment as well as affiliated cultural disruption.”³¹
— Maria Brave Heart

Brave Heart argues that the high rates of alcoholism, depression, suicide, homicide, domestic violence, and child abuse among American Indians can be attributed to these processes of internalized oppression. She suggests that remediation starts with identity formation which, in turn, rests on a revival of extended kin networks, a sense of belonging, and recognition of a shared history.

Traditional Diné (Navajo) therapy addresses trauma in the remediation of substance abuse. Matthew Kelley points out the following seven advantages of traditional therapy over accepted Western methods.³²

- (1) Cultural congeniality between client and practitioner.
- (2) An emphasis on personality, “power,” and rapport of the healer over mechanical technique.
- (3) Traditional healers are accessible, available, and permanent.
- (4) Indigenous practitioners act as role models to anchor the community.
- (5) Holistic therapy integrates psychology, physiology, social, and spiritual components.
- (6) Enhanced altered states, engaged emotional conditions, and sharply focused awareness are utilized in conjunction with culturally validated images.
- (7) Therapy reintegrates family, kins-people, and community.

²⁹ Peter A. Levine, op. cit., 58.

³⁰ Susan Lawrence, Creating a Healing Society: The Impact of Human Emotional Pain and Trauma on Society and the World, (Elite Books, 2006) 62.

³¹ Maria Brave Heart, “The American Indian Holocaust: Healing Historical Unresolved Grief,” in *American Indian and Alaska Native Mental Health Research*, v8(2) 1998, p. 68.

³² Matthew J. Kelley, “Culture as Treatment, Culture as Inoculation,” (Na’nizhoozhi Center, 2009) at

http://wellbriety-nci.org/Publications/culture_as_treatment.htm

Victimized cultures carry a unique unresolved grief, but they have no monopoly over alienation, which is recognized as a defining feature of Western culture.³³ Trauma and alienation have similar malingering effects in undermining one's character and spirit.

In those cases where alienation triggers substance abuse — which are most cases — indigenous therapy retains these same advantages. Why can't Western therapies and Western therapists provide these benefits even to members of their own culture?

Expanding the Healer

*"The shadow of the therapist crystallizes as pathology perceived in the patient."*³⁴
— Eduardo Duran

Western therapies fail to appreciate the breadth and depth of addiction. This must change for the benefit of culture generally, for the benefit of all of us who are addicted, and not just for the remediation of substance abuse.

Western therapies have not identified whom they serve, whether it's the corporate, state, and healthcare institutions, or the individual, family, and culture. Traditional healing unequivocally serves the individual, family, and culture. We should too.

Western therapists lack the power to direct healing on the family, kin, and community levels. Half of this is because we're not taught how or asked to play these roles. The other half of it is because our Western healthcare system serves a socio-economic structure that requires a level of alienation, just as the economy requires a level of unemployment.

Most importantly, Western therapists lack insight into their own self, family, and culture. This normal level of alienation is the heart of the Western predicament.

The Best Candidate for Addiction Therapy

*"How do we help patients when in reality we are in need of the same help we are offering?"*³⁵
— Eduardo Duran

It won't help if you agree with what I've said, but it might help if you recognize and fix your own flaws. Your best candidate for addiction therapy is yourself.

The first flaw of most professionals is to believe what you've been taught, and to think that you know what you're doing. The best thinkers have limited faith in what they know,

³³ Of many references, two are Patricia Hersch, [A Tribe Apart: A Journey Into the Heart of American Adolescence](#) (Random House, NY, 1998), and Robert Putnam, [Bowling Alone: The Collapse and Revival of American Community](#) (Simon & Schuster, NY, 2000).

³⁴ Eduardo Duran, [Healing the Soul Wound](#) (Teacher's College Press, 2006) 37.

³⁵ Eduardo Duran, op. cit., 111.

and do their best work when they leave it behind.³⁶ Traditional healers emphasize that they are not doing the healing, it's the energies that do the healing. Their role is simply to bring those energies to the patient.

If you want to enhance your skill in healing, then collect your power, sensitivity, and flexibility and seek your demons in the land of fear and confusion. If you have trouble finding this place, then recollect all those things that are most important about who you are and the life you lead and imagine permanently losing them one by one. This is your underworld, and it's a place of transformation. Going there is traumatizing and I hesitate to recommend it, but knowing its location will help you get your bearing.

Perhaps there is both good trauma and bad trauma because journeying to the underworld can be productive when you're prepared. Being prepared requires spiritual power, emotional sensitivity, and flexibility. I find power comes from life experience, while sensitivity and flexibility come from meditation and neurofeedback.

The transformative journey does not have to be terrifying, though it will be disturbing, confusing, and probably dangerous. Perhaps, in the end, it's not even a choice. Perhaps your task as an addiction therapist is not to prevent addiction, but to enable the addict to complete their journey through the underworld. Try it on yourself first.

Your second flaw, if you're like most people, is that you will create this land of transformation on the physical plane by making real the troubles you want to avoid. We always move toward what we focus on. In a tense situation we focus on what we want to avoid, thereby making it more likely. If you need a lesson in this truth, then ski through a steep, wooded slope and reflect, if you can, on where you're placing your attention. If you're looking for insight, don't be too attached to what you see and think.

This presentation is about neurofeedback, and the conclusion is this: find neurofeedback training for yourself because it can enhance your mind and your understanding of mind. Once this occurs you will better understand addiction, and be better able to help others understand it.

*"Our inner world of emotion, intention, and awareness plays a profound role in our ability to see... yet we spend years resisting exactly what we need in order to cure our 'nonexistent incurable disorders.'... self-awareness is the key to self-transformation."*³⁷

— Jacob Lieberman, O.D., Ph.D.

³⁶ Lincoln Stoller, The Learning Project, (2010) at <http://www.tengerresearch.com/learn/LearningProjectByAge.htm> - late

³⁷ Jacob Liberman, Take Off Your Glasses and See, (Three Rivers Press, 1995).