

Interpersonal Biofeedback

by Steven C. Kassel, LMFT and John LeMay, LMFT
January/February 2012

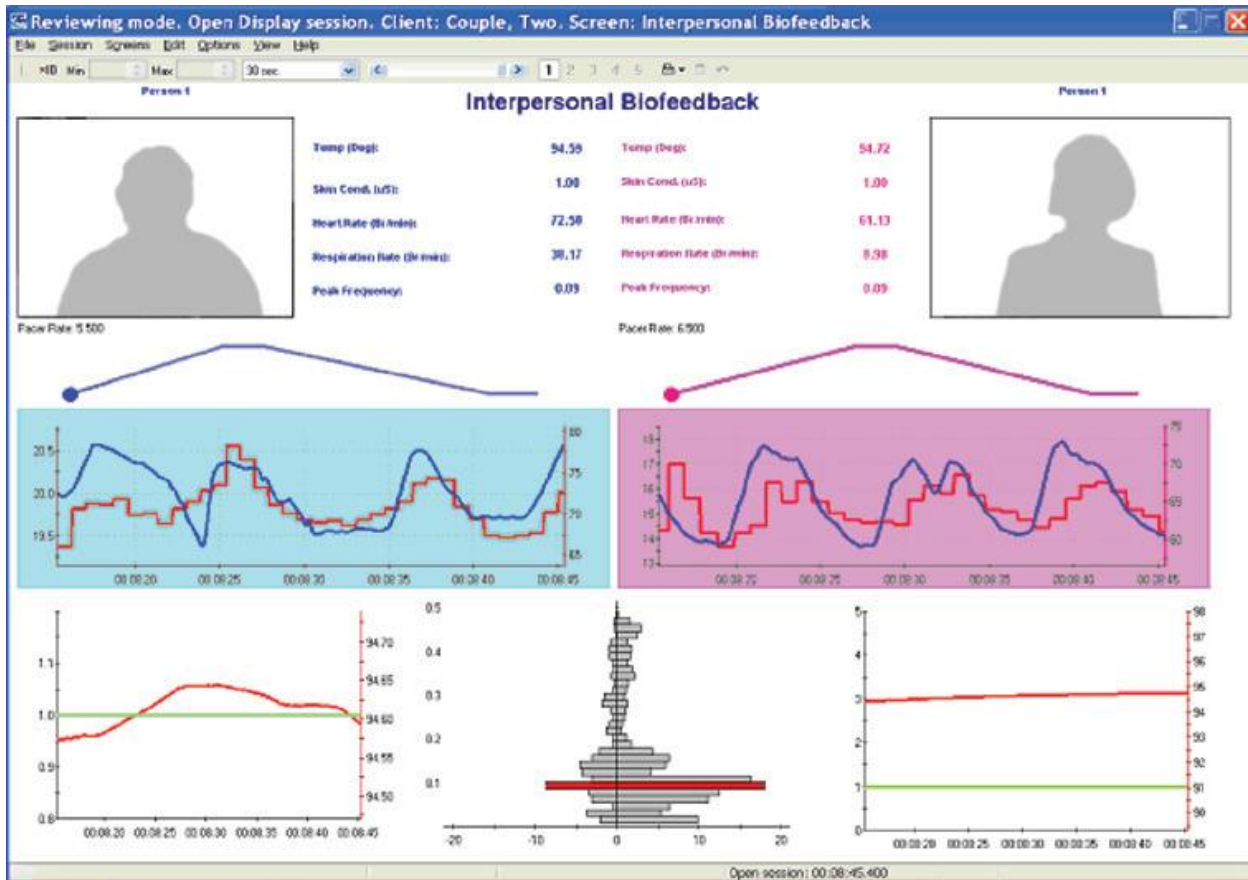
Biofeedback has been used since the 1970's in various ways to address pain management (Flor & Birbaumer, 1994), stress related medical disorders (Frank et al, 2010), and nervous system processing issues such as Autism (Coben, 2007), ADHD/ADD (Lubar, 2003; Monastra, 2005), OCD (Hammond, 2003), Depression (Walker, et al, 2007), Anxiety (Moore, 2000), and PTSD (Peniston & Kulkowsky, 1991). It has also been used in psychotherapy and Peak Performance Training with athletes (Strack, et al, 2011) and executives (Gruzelier et al, 2006). The authors of this paper have been utilizing biofeedback in the treatment of couples and families, hereafter referred to as Interpersonal Biofeedback, and theorize that merging biofeedback treatment modalities with interpersonal dynamics can benefit families and couples by assisting clients in understanding their own role in selfregulation, empathy and breaking of hyper-vigilance/reactivity patterns.

The Association for Applied Psychophysiology and Biofeedback provides the following definition of Biofeedback:

Biofeedback is a process that enables an individual to learn how to change physiological activity for the purposes of improving health and performance. Precise instruments measure physiological activity such as brainwaves, heart function, breathing, muscle activity, and skin temperature. These instruments rapidly and accurately “feed back” information to the user. The presentation of this information—often in conjunction with changes in thinking, emotions, and behavior—supports desired physiological changes. Over time, these changes can endure without continued use of an instrument.

When biofeedback is used to alter brain activity specifically by looking at brain waves or EEG, it is referred to as neurofeedback. Other biofeedback measures such as skin conductance, skin temperature, muscle tension (EMG) and heart rate measures are considered peripheral measurements or peripheral biofeedback. Though there are a few clinicians who use Neurofeedback with couples, the authors of this article primarily measure peripheral psychophysiological data for their therapy and research.

In Interpersonal Biofeedback, the clinician and the patients typically watch computer displays of hand temperature, sweat gland activity, respiration rate, heart rate and heart rate variability, as well as video displays of the participants in therapy. This approach is used in a variety of ways to help the couples and families understand their reactivity, their ability to recover, as well as the effectiveness of their attempts to soothe one another. It seems important to clarify here that the authors are each doing different things in their respective practices. John LeMay is working with families and couples in creating clinical therapy designs to address reactivity and recovery, whereas Steve Kassel has been looking at pre and post treatment comparisons of arousal during argument and its recovery.



In the assessment phase in John's couple work, and in Steve's research, short recorded videos of argument or dialogue can be reviewed for couples to observe not only their communication, but also vocal tone and facial expression as typically observed in couples counseling. In addition, associated peripheral psycho-physiological data allows them to see where there was a shift in physiology so they can deliberately work to self-regulate that physiology. Data from the sessions can be analyzed to look for evidence of change in arousal patterns of measured physiology.

In his groundbreaking research into couples and families, John M. Gottman, PhD, Professor Emeritus of the University of Washington, studied distressed and non-distressed couples for over 30 years. His research provided data showing physiological reactivity among couples engaged in various states of communication (arguing, appreciativeness, and emotional connectivity).

He concluded that there were three potential parameters for marital intervention:

1. **Physiology**
2. **Perceptual Framing and Attitudes**
3. **Interactive Behavior**

Of these three parameters, most marriage and family therapy interventions address #2 and #3, and hope that the other two will address #1. There are, however, a number of difficulties with this assumption.

The first of the difficulties is associated with a lack of understanding of basic human arousal. Bowen's Family Systems Theory drew many concepts from natural sciences, and Michael Kerr (Kerr, 1977) attempted to draw parallels to Bowen Family Systems Theory and the physiologic self-control learned through biofeedback. Kerr explained autonomic arousal, both sympathetic and parasympathetic, as they related to socialization, orienting reflex (response to stimuli) and habituation:

A person, an organism, can be viewed on a continuum of arousal (Silverman, 1959), progressing from inattention to external events associated with sluggish activity to an alert, wakeful, vigilant state with facilitated psychomotor performance, organized and appropriate reactions to stimuli, and goal directed behavior. However, if the person becomes more aroused, more activated, he may become panicky and unable to differentiate meaningful from non-meaningful stimuli and unable to focus on or limit his attention to appropriate goal tasks. His behavior may become hyperactive and more disorganized. This disorganized end of the continuum reflects intense central nervous system activity and can be measured psychophysically.

Kerr discusses Bowen's description of fusion of intellectual and emotional processes whereby a person operates on an automatic reactivity, is less flexible and less adaptable. The goal of therapy according to Kerr is to help a person free the intellectual (thinking) from the emotional (reactive) in order to create more flexible, adaptable, and emotionally independent functioning. He cites the work of Stern (Stern, 1966) on anxious interactions within a system and notes how physiological systems may become conditioned and prone to dysfunction later in life. Kerr then speculates how this sensitization may be transmitted from one generation to the next. Biofeedback, Kerr says, has an "untapped potential" of modifying multigenerational programming.

A second difficulty in ignoring the physiology in marital intervention is revealed by examining stress physiology. Stress can be interpreted as any perceived challenge to the survival of a system (Sapolsky, 1990). Our bodies and brains are learning and efficiency systems, and our survival mechanisms are designed to be activated more readily as we learn. In a sense our limbic system (an emotional regulatory system in the central nervous system) is designed to take over functioning when survival is questioned. The amygdala, a part of that system which gives emotional tags to a variety of situations, always makes a "feed-forward mistake." For example, for human survival it is better to mistake a twig for a snake (perception of potential threat) and to move out of the way, than to mistake a snake for a twig (interpret as harmless) and pick it up. Unfortunately, our brains and bodies do not differentiate well between psychological and physiologic stress (Sapolsky 1990). In couples and family therapy, this applies readily to a variety of contexts. In situations of loneliness and distance, spouses have often disengaged with each other, concluding that the other person is not truly capable of being trusted with emotional process. In situations of heated conflict, psychological survival will trump empathy when there is a lack of trust in a partner's process. Far too often a neophyte and even experienced therapist may forget that helping a client learn to self-soothe is primary in the therapeutic venture and may push for "deeper" material, only to overload the client in anxiety and sabotage the treatment.

There are three basic hypotheses of interpersonal biofeedback and they are as follows: First, if a person can learn to better manage and train his/her physiologic responses and flexibility to arousal, then he/she can better manage the interpersonal context by becoming collaborative

rather than survival-oriented. A person that is not in states of over arousal and hyper-vigilance is more likely to respond to conflict with a positive sentiment override instead of a negative sentiment override (positive vs. negative situational framing). This positive response enhances the power of repair attempts made within families and couples, by returning physiology to a more benign state of arousal and attention, rather than anxiety and hyper-vigilance. Second, it is the job of the therapist to assist clients in discovering their own power to influence their emotional responses and therefore their environment. This is done through increasing awareness of choice in reactivity and recovery resulting in empowering personal action and responsibility. Third, therapy must be active and interactive for the participants. Therapy is not merely the action of talking with the family members about the problems or providing cognitive or behavioral strategies, but coaching the family members to interact more effectively, while observing the monitor and self-regulating physiology. In this light, biofeedback is a major tool in the tool bag of the therapist in helping the client understand and therefore manage their levels of sympathetic arousal in interpersonal contexts.

An example could be like the following couple:

Mike and Lisa entered therapy after his return from Afghanistan. They had been married for 15 years, but he had been deployed a year ago with the Army. Mike entered treatment admitting that he was struggling with anger since his return from Afghanistan, and Lisa made brief mention of anxiety symptoms on her intake questionnaire. As they talked they both admitted that they had grown ambivalent about their relationship over the past several years. "It is not that we fight, we just don't connect," said Lisa. In discussing the relationship we were able to pin down an interactive cycle that caused both of them to withdraw from each other. Neither of them wanted to feel alone in the marriage and the attraction was still alive, but the pattern of hurt feelings and withdrawal and Mike's anger since his return had recently caused them to question their relationship.

Marriage and Family Therapists often piece together stories like this. Often such patterns are couched as ineffective narratives, vicious circles, emotional stalemates, ineffective systems dynamics, multi-generational transmissions, or focusing on PTSD. However, a clear understanding into their psychophysiology helped illuminate the situation and break the stalemate.

After describing the use of biofeedback and helping them orient to coherent breathing, reduced heart rate, and skin conductance, they began to talk to each other and watch how their communication was affecting each other. They were also able to see how, when they relaxed their bodies with each other, the communication about deeper issues became easier. Sessions started with relaxation training and then moved into discussions, giving room for them to see how they were reacting and responding to each other. At the end of each session, we debriefed and gave tasks to practice between sessions. At the end of treatment, they stated to the therapist that they had learned how to relax with each other and forge a deeper trust. Mike was able to put his anger into words as he learned to manage his intensity and think rather than simply react in frustrating situations. Lisa was able to overcome a long time undiagnosed anxiety disorder by learning to temperature train and manage her breathing.

Steven C. Kassel, LMFT, is Board Certified in Biofeedback and Board Certified in Neurofeedback. He has practiced biofeedback since 1985 and licensed as an MFT since 1991. He is past President of the Biofeedback Society of California.

John LeMay, LMFT, is Board Certified in Biofeedback. He is in private practice in Reno, NV. He is past President of the Biofeedback Society of California.

Both authors will be presenting the workshop Advances in Biofeedback: What a Therapist Needs to Know About Biofeedback, Neurofeedback and Interpersonal Feedback at the May, 2012 CAMFT Conference.

References

Bowen, M. (1971), Family and Family Group Therapy. In Comprehensive Group Psychotherapy (Kaplan and Sadock, eds.). Baltimore: Williams and Wilkins.

Coben R, Padolsky I. (2007), Assessment –Guided Neurofeedback for Autism Spectrum Disorder. Journal of Neurotherapy; 11:5-19.

Flor, H., & Birbaumer, N. (1994) Psychophysiological Methods in the Assessment and Treatment of Chronic Musculoskeletal Pain. In J. G. Carlson, A. R. Seifert & N. Birbaumer (Eds.) Clinical applied psychophysiology. Plenum, New York

Frank, D., Khorshid, L., Kiffer, J., Moravec, C., McKee, M., (2010), Biofeedback in Medicine: who, when, why and how?, National Institute of Mental Health, Ment Health Fam Med.,7(2): 85-91

Gottman, John, (1999) The Marriage Clinic: A Scientifically Based Marital Therapy. W.W. Norton & Company, New York. Gruzelier, J., Egner, T., & Vernon, D. (2006), Validating the Efficacy of Neurofeedback for Optimising Performance. Progress in Brain Research,159, 421-431.

Hammond, D. C. (2003). QEEG-Guided Neurofeedback in the Treatment of Obsessive Compulsive Disorder. Journal of Neurotherapy, 7(2), 25-52.

Kerr, M. (1977). Aspects of Biofeedback Physiology and its Relationship to Family Systems Theory. The American Journal of Psychoanalysis, 37:23-35

Lubar, J. F. (2003). Neurofeedback for the Management of Attention Deficit / Hyperactivity Disorders. Chapter in M. S. Schwartz & F. Andrasik (Eds.), Biofeedback: A Practitioner's Guide Third Edition. New York, Guilford, 409-437.

Monastra, V. J., (2005). Electroencephalographic Biofeedback (Neurotherapy) as a Treatment for Attention Deficit Hyperactivity Disorder: Rationale and Empirical Foundation. Child & Adolescent Psychiatric Clinics of North America, 14(1), 55-82.

Moore, N.C. (2000). A Review of EEG Biofeedback Treatment of Anxiety Disorders. Clinical Electroencephalography 31(1), 1-6.

Peniston, E. G., & Kulkosky, P. J. (1991). Alpha-Theta Brainwave Neuro-feedback Therapy for Vietnam Veterans with Combat-Related Post-Traumatic Stress Disorder. Medical Psychotherapy, 4, 47-60.

Sapolsky, Robert (January 1990). "Stress in The Wild". *Scientific American* **262** (1): 106–113.

Silverman, A.J., (1959), Investigation of Psychophysiological Relationships with Skin Resistance Measurements. J. Psychosom. Res 4:65.

Strack,B; Linden, M. & Wilson, V (Eds) (2011). Biofeedback and Neurofeedback Applications in Sport Psychology. Association of Applied Psychophysiology and Biofeedback, Wheatridge, Co.

Walker, J. E., Lawson, R. & Kozlowski, G. (2007). Current Status of QEEG and Neurofeedback in the Treatment of Depression. Chapter in J. R. Evas (Ed.), Handbook of Neurofeedback. Binghamton, NY: Haworth Medical Press, pp. 341 – 351.