

Biofeedback: Using the Power of the Mind–Body Connection, Technology, and Business in Psychotherapies of the Future

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This article examines biofeedback within the context of American health care, mind–body practice, clinical psychology, technology, and business. American medicine is shifting its emphasis from disease management to health promotion, prevention, and integrative symptom management. This biopsychosocial approach requires the use of clinically and cost-effective behavioral health interventions. Biofeedback is an ideal tool because it harnesses the mind–body connection to help patients improve disease conditions and even achieve optimal health. With its capability to teach self-regulation, to treat a variety of chronic disease conditions, to blend the technical and the humanistic, coupled with its budding research profile, biofeedback can offer clinically and cost-effective, interventions that fit nicely into the primary care delivery system. The push of the American Psychological Association for psychologists to practice in primary care settings along with the extensive training in lifestyle interventions that clinical health psychologists undergo makes them uniquely qualified to integrate biofeedback into clinical health practice. If psychologists routinely included biofeedback in their psychotherapy practices and honed their entrepreneurial skills to market it, they could create a mind–body intervention that increases the demand for behavioral care. Thus, biofeedback offers an opportunity to invigorate American psychotherapy, as the American health care system will benefit from effective holistic mind–body practices.

Public Significance Statement

This article addresses how biofeedback, if routinely incorporated into current psychotherapy practice, could enhance health care by providing clinically and cost-effective behavioral interventions. Biofeedback can help people to make lifestyle changes by teaching them to self-regulate their physiological processes, to handle life stressors more effectively, to cope with and improve chronic medical conditions, and to enhance overall performance. Psychologists are particularly well suited to assume a leadership role in promoting the use of this beneficial intervention which can promote holistic care within the American health care system.

Keywords: biofeedback, psychotherapy, mind–body connection, technology, business

Psychologists are at a crossroads at which they can seize a unique professional opportunity to embrace, refine, and promote biofeedback as an intervention to be routinely integrated into psychotherapy practice. Given the recent [American Psychological Association \(APA, 2017\)](#) thrust for clinical and health psychologists to work in primary care settings, and their background and knowledge about the effects of lifestyle upon health, psychologists are in a favorable position to assume a leadership role in integrat-

ing mental health and medical care. Biofeedback can serve as a significant tool in the process because it signals that a person's health is a function of complex interactions between body and mind and both must be considered in an integrated health practice. Furthermore, if psychologists combined clinical expertise in biofeedback with sound business customs ([Walfish & Barnett, 2009](#)), lucrative business prospects may arise. In this article, we examine the potential of cultivating the use of biofeedback within the

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context of mind—body practice, clinical health psychology, primary care medicine, technology, and business.

Biofeedback is a clinical tool that taps into the connection between body and mind and diminishes the gap between them. The patient is seen not just as a body or not just as a mind—but as an integrated whole. Biofeedback can be used as a stand-alone intervention or as a complement to traditional forms of psychotherapy. The Association for Applied Psychophysiology and Biofeedback (AAPB, 2018) defines *biofeedback* as

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 brain waves, heart function, breathing, muscle activity, and skin temperature. These instruments rapidly and accurately provide “feedback” 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.

Examining a case illustrates how biofeedback might be routinely integrated into psychotherapy practice.

Dr. Bell is a biofeedback-certified psychologist who practices in an integrated care medical home (Novotney, 2014). As recommended by the APA, Dr. Bell practices in a primary care setting and is committed to a biopsychosocial approach. His health care team includes a primary care doctor, nurses, a physician’s assistant, a psychologist, and accessible specialists. The team’s primary care doctor referred Jessica to Dr. Bell because she suspected a diagnosis of generalized anxiety disorder and panic attacks. Jessica described herself as “constantly overwhelmed with stress.” Dr. Bell began Jessica’s treatment with cognitive therapy, through which she discovered that her irrational thinking exacerbates her anxiety. Dr. Bell sees the body as a window into the mind and uses Jessica’s physiological reactions to inform treatment. He noted that when she is anxious, her breathing is shallow, her face is flushed, and her hands are cold and clammy. Via the display on the biofeedback computer screen, Jessica saw a visual representation of her heartbeat, breathing, galvanic skin response, and muscle tension. She learned that when she is anxious, her breath quickens. She hyperventilates and feels even more frightened. Dr. Bell trained her in heart rate variability. Jessica was then able to calm her intense emotions. When her body is relaxed, she is less prone to worrisome thoughts. When her thoughts are less agitated, her body becomes more relaxed. This psychotherapy calls on both her mind and body to coordinate. As a result of treatment, she told Dr. Bell that she feels less stressed and more in control of her stress. Dr. Bell was satisfied with her progress. Jessica offered anecdotal affirmation that since biofeedback made her more aware of the connection between her body and her mind, she has been better able to manage her anxiety (Moss & Khazan, 2016). Dr. Bell reported Jessica’s favorable response to the members of his treatment team who were pleased by his integrated biofeedback and psychotherapy approach.

The treatment illustrates how a clinical health psychologist can use the mind–body connection to maximize the patient’s healing power. Intuitively, Dr. Bell knew that Jessica was helped by integrating biofeedback into therapy. But clinical intuition must be confirmed through research evidence. We look at information and

evidence that supports the effectiveness of biofeedback in clinical practice.

American Health Care and Psychotherapy: A Shift in Perspective

In the past, the allopathic model prevailed in American health care, meaning practitioners fight disease by using invasive remedies such as pharmaceuticals, surgery, and radiation (National Cancer Institute, 2017). Medical doctors did not customarily consider the importance of how a physical disease affected a patient’s mental status. However, George Engel’s (1977) model, which posited that disease stems from an interaction of biological, psychological, and social factors, set off a process through which allopathy is falling to the biopsychosocial model (Young, 1996). Nonetheless, remnants of Descartes’s philosophy of mind–body dualism remain ingrained, both in medical practice and in psychological practice (Heineman & Froemke, 2012). Benson (2000; Benson-Henry Institute, 2018) pointed out that whereas growing numbers of medical professionals appreciate the mind–body connection, medicine still maintains a reductionist view searching for specific factors that cause illness and specific pills and procedures to treat it. Full integration of mind–body medicine into mainstream health care is not complete. Psychologists can work harder at integrating body and mind in their work. More than 500 forms of psychotherapy have evolved since Freud created his talking cure (Ellenberger, 1981; Lilienfeld & Arkowitz, 2012; VandenBos, Meidenbauer, & Frank-McNeil, 2016). Most models do not incorporate how a person’s physiology affects his or her mental states. Although the *DSM-IV* emphasized that diagnosed medical conditions on Axis III needed to be considered in mental conditions, subtler physical processes such as the stress response drew little attention. Most types of psychotherapy do not cue the therapist to routinely seek out information about mind–body interactions. (Borrell-Carrio, Suchman, & Epstein, 2004). Although many attempts to integrate psychotherapies exist (Luyten, 2015; Silverman, 2013), the integration that deserves immediate scrutiny is the one between the body and the mind. Leitan and Murray (2014) exclaimed that a peculiar state of affairs exists when the space between mind and body is so ambiguous in so many models of psychotherapy. Psychologists can use biofeedback as a part of treatment to help to close this mind–body gap and simultaneously enhance clinical psychotherapy practices. Now is an optimal time to integrate biofeedback into a psychologist’s clinical practice because biofeedback

- fits into the current American medical practice as the system shifts from an allopathic to a biopsychosocial perspective;
- is a good match for the educational background and skill set of clinical and health psychologists;
- provides interventions that are congruent with the practices of integrated primary care and clinical health psychology;
- suits today’s digital techno culture with its emphasis on computers, apps, and electronic feedback and to self-regulate;
- is evidence based, with a respectable scientific research track that can and should be expanded;

- is compatible with today's health care economics and the quest for cost-effective care;
- is currently underused and, thus, has incredible growth potential; and
- is regulated by standards that emanate from professional societies with consideration for issues of diversity.

Biofeedback practitioners have a mindset that regularly asks the following questions: "How does psychological process affect physical states?" "How does physical process affect psychological states?" "How does a recurring stress response take a toll on body and mind?" (Burke, 2003; Schwartz & Andrasik, 2003; Shaffer & Moss, 2006). For example, sufferers from Raynaud's disease experience spasms of the small arteries in the digits of the hands and feet which cause color changes, loss of sensation, and pain. Stress and emotional and psychological events can provoke episodes of the disorder. Biofeedback training in relaxation and finger and toe warming can improve this medical condition (Schwartz & Sedlacek, 2003). Treatment that brings body and mind together are touted, promoted, developed, and researched by biofeedback experts.

Rise of Integrated Health Care and Clinical Health Psychology

The National Center for Complementary and Integrative Health (2017) attested that the "complementization and integrationism" of American medicine is underway, with its priority to shift health care from a disease management system (allopathic) to a health promotion, prevention, and integrative symptom management system. In fact, combined mind-body care and technological advances are encouraged for clinical effectiveness and cost-saving reasons.

Growing numbers of doctors champion integrative medicine. For example, (and there are many more) maverick MD, Andrew Weil (2004, 2016; Heineman & Froemke, 2012; University of Arizona Center for Integrative Medicine, 2018) trains primary care doctors at the University of Arizona. His program demands that Western medicine endorse goals that include the restoration of the balance of mind, body, and spirit in which psychotherapy can play an essential role by connecting mind and body (Weil, 2016). Dean Ornish (2008), MD, a health care guru who established the Spectrum Program, has compiled extensive evidence that lifestyle choices such as diet, stress reactivity, exercise, and quality of social support are of the utmost significance (Ornish, 2017). The Benson-Henry Institute (2018) provides mind body medicine treatment and training and advocates and sponsors evidence based research.

The APA (2017) advises psychologists to explicitly monitor both the physical and emotional aspects of any condition in order to generate helpful synergistic effects and advocates for primary care perspectives. Behavioral health practitioners have added their voices to those of such medical frontrunners (APA, 2014; Belar, 1997; Kay & Myers, 2014) and advocate for the advancement of clinical health psychology and primary care psychology. Clinical health psychology is the application of scientific knowledge of the interrelationships among behavioral, emotional, cognitive, social, and biological components in health and disease to the promotion and maintenance of health and the prevention, treatment, and rehabilitation of illness and disability (Belar, 1997). And clinical

health psychologists have fostered the use of lifestyle change therapies and third wave techniques such as mindfulness, meditation, focused concentration, compassion, virtual reality, and acceptance are prevalent in current therapy practice (Castonguay, Eubanks, Goldfried, Muran, & Lutz, 2015; Kabat-Zinn, 2013; Moss & Khazan, 2015).

The public has developed an appetite for holistic care. Frustrated with health models that dehumanize them, patients are voting with their dollars. The 2012 National Health Interview Survey conducted by the National Center for Health Statistics (Clarke et al., 2015) found that 59 million Americans spent \$30.2 billion out of pocket on complementary health approaches—\$28.3 billion for adults and \$1.9 billion for children. The spending represents 1.1% of the \$2.82 trillion total health care expenditures in the United States and 9.2% of the \$328.8 billion out-of-pocket health care costs (Clarke et al., 2015). Clients are seeking alternative approaches.

Modern Technoculture and Biofeedback

Biofeedback is a blend of the technical and the humanistic, which offers wide appeal in today's techno culture. Recent generations are geared to using technical devices for "everything." Technological innovations can lift barriers to make health care resources more accessible. A user is able to sample mental health programs with no risk or to use affordable, private online counseling. As technology improves accessibility, it has decreased the stigmatization associated with using therapies to reduce stress and has raised consciousness about the value of therapy. This permits people to enjoy anonymous and anxiety-free experimentation. Savvy clients can access therapeutic interventions at the touch of a screen or the click of a mouse (Clough & Casey, 2011; Detweiler-Bedell & Whisman, 2005; Melville, Casey, & Kavanagh, 2007).

The ability to monitor, track, and record physiological functioning makes technology a boon to the growth of biofeedback (Clough & Casey, 2011; Detweiler-Bedell & Whisman, 2005; Melville et al., 2007). Smartphones make it viable to wear a body sensor that can monitor physiology such as heart rate and breath and transmit the information wirelessly via an app that can provide data and feedback about behavior (Clough & Casey, 2015). Apps, computers, and electronic feedback enable people to self-regulate their physiological activity from home or work with the intent to enhance overall health. Online approaches and mobile smartphones can tap into self-help and evidence-based treatment programs instantaneously (Harrison et al., 2011; Proudfoot, 2013). Stress management has become a household phrase (Sapolsky, 2004), and apps for managing stress abound on the Internet. And aren't all therapies forms of stress management?

Respectable Scientific Evidence Base for Stress and Stress Management Research

A solid body of scientific evidence leaves no doubt that biopsychosocial factors affect health status (Engel, 1977) and that coping with the stresses of modern daily living is essential to good health (Sapolsky, 2004). Stress, as well as the mere perception of stress, can result in and exacerbate illnesses (Borrell-Carrio, Suchman, & Epstein, 2004; Uribe-Marino et al., 2016; Vavogli & Darviri,

2011). Nowhere is the effect of stress and the interaction of mind, body, and environment more apparent than in Elizabeth Blackburn's (Mathur et al., 2016) Nobel Prize-winning findings. Perceived or real stress affects telomeres, which are structures at the end of chromosomes that shape cellular aging. Stress shortens telomeres, and shortened telomeres shorten human lifespans (Telomere Diagnostics, 2017). However, it is possible to reverse this process. Definitive research shows that genetic expression can reshape the brain and bring about positive mental and physical states (Bhasin et al., 2013). Studies show that helping people cope with stress and anxiety increases health quality (Segerstrom & Miller, 2004; Sapolsky, 2004). Manage the stress, and telomeres lengthen, thereby increasing life span. Thus, participation in psychotherapy, which reduces stress levels, might even lengthen life (Epel et al., 2004; Ornish, 2008).

Biofeedback experts (AAPB, 2018) see biofeedback as an effective stress reduction instrument. Research shows that if combined effectively with medical therapies, biofeedback can be part of the treatment for a number of disorders (Schwartz, Collura, Kamiya, & Schwartz, 2016). Tried-and-true biofeedback protocols direct treatment for costly disorders such as anxiety, depression, and chronic pain, using well-developed professional standards and guidelines for competent practice (Moss, 1998; Schwartz & Olson, 2003). Competent biofeedback practitioners emphasize the importance of a research-based approach to practice and to understanding the physiological mechanisms underlying interventions (Peper, Harvery, & Takabayashi, 2009).

Evidence-based biofeedback practice means using the best evidence to guide the delivery of health services (Frank, Khorshid, Kiffer, Moravec, & McKee, 2010). The AAPB and the International Society for Neuronal Feedback and Research (ISNR) have provided a valuable resource by collating and publishing obtainable evidence showing that biofeedback can help clients who suffer from more than 39 conditions and chronic illnesses (Frank et al., 2010; Tan, Shaffer, Lyle, & Teo, 2016; Yucha & Gilbert, 2004; Yucha & Montgomery, 2016). The boards of directors of the AAPB and ISNR adopted joint task force-generated guidelines for evaluating the clinical efficacy of biofeedback and neurofeedback (LaVaque et al., 2002). The AAPB published *Evidence-Based Practice in Biofeedback and Neurofeedback* (Tan et al., 2016). There are five levels of success from Level 1 (not empirically supported) to Level 5 (efficacious and specific) based on the schemes established by the APA and other professional/medical establishments. The one disorder that meets the criteria for the efficacious and specific category for biofeedback is urinary incontinence in females.

The "efficacious" category involves 14 disorders with which many psychologists are familiar. These include anxiety and anxiety disorders, adult headache, attention-deficit/hyperactivity disorder (ADHD), chronic pain, constipation, depressive disorder, diabetes mellitus, epilepsy, erectile dysfunction, fecal incontinence, hypertension, irritable bowel syndrome, preeclampsia, Raynaud's disease, and temporomandibular muscle and joint disorder. Biofeedback success in treating patients with these conditions can provide multiple practice opportunities. Furthermore, psychologists can choose to specialize in specific conditions. For example, some practitioners devote their neurofeedback practice to children who are diagnosed with ADHD. The AAPB (2018) website has a

link that allows the user to find suitable practitioners with a simple click.

The "probably efficacious" category lists 13 disorders, including substance abuse, arthritis, asthma, autism, brain facial palsy, fibromyalgia, insomnia, motion sickness, performance enhancement, posttraumatic stress, tinnitus, traumatic brain injury, and urinary incontinence in children, men, and women. Classified as "possibly efficacious" are 10 disorders that include cerebral palsy, chronic obstructive pulmonary disease, coronary heart disease, functional recurrent abdominal pain, hyperhidrosis, immune function, repetitive strain injury, stroke, tinnitus, and vasovagal syncope.

Psychotherapeutic and behavioral treatment of many of these conditions would be welcomed in primary care and integrated care practices. For example, the Cleveland Clinic touts favorable results in its research on the effects of biofeedback on patients with chronic health conditions such as coronary artery disease, diabetes, or multiple sclerosis (Cleveland Clinic, 2017; Frank et al., 2010; Moravec & McKee, 2011). Recently, a number of college campuses have found success in helping students deal with stress and anxiety by using biofeedback (Ratanasiripong, Sverduk, Prince, & Hayashiro, 2012). Interested readers will find a rich array of resources to support the evidence base of the clinical application of biofeedback, beginning with Tan et al. (2016). However, more research is necessary in the future and, given the will and the funding, might elicit findings that further support its efficacy and effectiveness. Given these facts, biofeedback can serve as a bridge between allopathic medicine and alternative medicine because it is in harmony with some of the values of both. Biofeedback makes sense to the scientifically minded (Moss, 1998).

One subject which has not been fully addressed is diversity and multiculturalism in biofeedback. The current dearth of research indicates an in-depth investigation into this area of practice is essential in order to properly identify Western and nonwestern assumptions affecting practice (Harvey, Lin, & Booman, 2015).

Biofeedback: An Underused Resource

Although some experienced clinicians claim that biofeedback is gaining acceptance with the American public (Frank et al., 2010), in reality few people can even define it. Even many of those who seek out complementary care do not buy it. The 2015 National Health Statistics Report shows that Americans chose to pay for acupuncture, Ayurveda, biofeedback, chelation therapy, chiropractic care, energy-healing therapy, special diets, folk medicine or traditional healer, guided imagery, homeopathic treatment, hypnosis, naturopathy, nonvitamin/nonmineral dietary supplements, massage, meditation, progressive relaxation, qui gong, tai chi, or yoga. The most popular complementary health approach was the use of dietary supplements. The second most commonly chosen techniques were deep breathing exercises, with yoga as the most used (11.6% in 2002; 10.9% in 2012). The use of yoga, tai chi, and qui gong increased (5.8% in 2002; 10.1% in 2012). Biofeedback ranked second to last of the commonly used methods, accounting for less than 0.1% among those who used complementary approaches at three time points (2002, 2007, and 2012). Only Ayurveda was chosen less (Clarke et al., 2015). In the last Delphi poll, Norcross, Pfund, & Prochaska, (2013) ranked biofeedback 33rd in terms of future growth. Biofeedback is enormously unde-

used, leaving its potential untapped. The bad news is that many who could benefit do not access this valuable treatment. The good news is that a nearly zero market penetration rate gives psychologists a window of opportunity to establish biofeedback practices, which will be discussed later in the article.

However, although biofeedback has evolved since its conception in the 1960s (Moss & Khazan, 2016) not at a pace to reach its full potential. Why not? Some of the variables that played a role in biofeedback's underutilization in the past, have changed, and we need to understand how so we can see why and how biofeedback practice can expand today.

Why Biofeedback Is Underused and How to Change This

Early in the history of biofeedback, the equipment needed was difficult to operate, bulky to carry around, expensive, and sparse. This is no longer true. Technological advances discussed earlier have made biofeedback equipment much more user-friendly, portable, affordable, and plentiful. Numerous companies have created sophisticated devices and they constantly upgrade them. These include Thought Technology, J & J Engineering, and Nexus, among others (Khazan, 2016; Thomas, 2011). The ubiquitous nature of technology makes biofeedback readily available even on a smart phone. However, it is important to choose legitimate devices by checking with expert organizations such as Biofeedback Certification International Alliance (BCIA; Slawicki, 2009).

Academic approval has been slow and sparse. It is rare for psychology or health programs to include biofeedback training in their curricula. Few professors are skilled in biofeedback. Programs do not usually mature unless an impassioned faculty member drives the initiative and an administration provides material support, which can be problematic. Although one apparatus is affordable for a solo clinician, equipping an entire university lab with biofeedback equipment is pricey. However, some forward-thinking universities now sponsor biofeedback programs. For example, the BCIA (2018) lists 13 regionally accredited universities offering biofeedback courses that fulfill the didactic requirement for BCIA certification. With this limited number of programs, few university students are exposed to biofeedback. If more programs are developed, an increasing number of students will be able to train in biofeedback to use in future practice. Furthermore, university sponsorship of biofeedback training will stimulate more research through theses, dissertations, laboratory studies, and grant seeking. Currently, training is concentrated in nonacademic and commercial training programs to fulfill the didactic requirements of the BCIA accreditation process.

A lack of parity between reimbursement for mental and physical health means a scarcity of insurance funding for biofeedback and thus, stunts growth. This, too, is changing. Professional organizations have fought for insurance coverage for biofeedback with some success. The specifics of this struggle can be viewed through AAPB's (2018) website. With mounting evidence of its effectiveness, insurance companies are more likely to compensate so biofeedback can be better integrated into health care systems (Cummins & O'Donohue, 2008).

Professional turf issues may play a role. Who gains? Who loses? Although a literature search showed no published, documented cases, some verbal reports have been made about pharmaceutical

companies, medical corporations, and profiteering prescribers who are competitors for the behavioral health revenue, dismiss the value of biofeedback. They portray an attitude that biofeedback is "unsubstantiated" and "no better than a massage." Even professional societies may argue over scope of practice (Cohen, 2014). This narrow focus constricts biofeedback's potential growth.

Finally, failure to recognize biofeedback as "good business" means psychologists have missed opportunities to give a lift to psychotherapy practice. The economics of health care indicate that biofeedback may have a significant place in its growth which are discussed later. How might a psychologist add biofeedback to practice? We have discussed the why, now let's look at the how.

Training in Biofeedback: Professional Organizations and Training

Currently AAPB sponsors four certifications in biofeedback: general biofeedback, neurofeedback, heart rate variability biofeedback, and pelvic floor disorders (e.g., urinary incontinence). The international certification organization, the BCIA (see www.bcia.org) certifies those practitioners who meet the educational and training standards needed to obtain standing. The BCIA established a blueprint of the knowledge and skills needed to be a certified biofeedback practitioner and upholds professional standards and ethics.

There are three major international and national professional organizations for biofeedback practitioners. These are the AAPB, the BCIA, and the ISNR. Regional and state organizations also exist which actively recruit members and provide educational conferences and training (Tan et al., 2016). These organizations work to promote biofeedback through communication, research, and media exposure, as well as by increasing public knowledge of biofeedback and promoting its reimbursement. Training programs, both University and commercial, are listed on the AAPB (2018) website.

Biofeedback practitioners train to teach clients self-regulation through respiratory training, which measures the rate and pattern of breathing and blood levels of carbon dioxide; cardiovascular training, which focuses on heart rate and heart rate variability, respiratory sinus arrhythmia, and blood volume pulse; neuromuscular modality, which looks at muscle tension with surface electromyography; skin conductance, which trains and measures sweat gland activity; peripheral skin temperature, which trains finger and/or toe temperature; central nervous system modalities, which are generally referred to as neurofeedback measuring electrical signals from the brain using electroencephalography (AAPB, 2018; Khazan, 2016; Tan et al., 2016).

Professionals other than psychologists perform biofeedback and include physicians, nurses, physician's assistants, physical therapists, occupational therapists, social workers, speech pathologists, health coaches, sports performance trainers, and counselors (see www.bcia.org). However, psychologists are well qualified to become certified in biofeedback and form practices based on or incorporating this intervention. Their eclectic education emphasizes an understanding of the physiology of stress, stress management, psychotherapy, models of helping behavior, and lifestyle health. Clinical health psychologists live the biopsychosocial model. But more is needed to promote practice than clinical

acumen. Entrepreneurship is essential. Failure to recognize biofeedback practice as “good business” could be fatal to its future.

The Business of Biofeedback and Health Care Economics

Now that we have examined its clinical potential, it is time to get down to business. Brown and Minami (2010) pointed out a blunt truth: There is no future for psychotherapy unless providers address the realities of the business world. Psychologists must aspire to be both effective clinicians and skilled business persons (Austad & Gendron, 2015; Britt, Klontz, Tibbetts, & Leitz, 2015; Cummings, O’Donohue, & Cummings, 2011). Biofeedback, an underused intervention, may be a good business investment.

First profit, loss, and cost are key parts of the engine that drives American health care. Payers, insurers, and politicians focus on financial incentives at the risk of compromising care as they aspire to maximize profit and reduce costs. It may seem callous to conceive of health care (and psychotherapy) as a commodity (Brown & Minami, 2010), but the reality is that American health care is a trillion-dollar industry (E. Rosenthal, 2017). Payers are on the lookout for more “cost-effective” products and to create methods such as managed care to bridle health care costs (Starr, 1982). Reinforcement by reimbursement has been a powerful driver in shaping practice. Therapies that fill payer’s criteria will be reimbursed, and those that do not will not be covered (Cummings et al., 2011). For example, short-term cognitive therapies are valued, popular, and prevalent, whereas long-term therapies are devalued (Maljanen et al., 2016; Sean, 2016). The short-term therapy advocates were able to provide more evidence more quickly to support the cost effectiveness of their models, whereas long-term therapists languished as a result of the time-consuming, complex, and prohibitive cost of research on long-term work. Here, biofeedback’s potential shines because it seems to be cost-effective and because it is at the very core of self-regulation in the autonomic nervous system (AAPB, 2018; Miller, 1978; Moss, 1998).

One area in which biofeedback may hold promise is in dealing with the somaticizing patient. A smart investor would be interested research that could show that biofeedback is an effective tool to use with somaticizing patients and save trillions of health care dollars. Estimates are that more than 60% of visits to primary care physicians are from somaticizers who have physical symptoms due to psychological distress (Austad, 1996). When these patients are treated with the correct type of psychotherapy, their medical utilization decreases. This well-researched medical offset effect occurs when the cost of psychological treatment saves overall expenses for medical care (Chiles, Lambert, & Hatch, 1999; Holder & Blose, 1987). Doctors who are frustrated when they cannot find an underlying physical disease in somaticizing patients often think or even say to their patients, “It’s all in your head.” The patient may feel invalidated, resentful, and frightened and even become a “doctor shopper,” seeking out even more medical opinions and advice regarding their symptoms (Cummings, 1997). Treating the client to self-regulate physical and mental processes could allow the psychologist to break through the resistance of the somaticizer who finds it reassuring when a provider includes the body as part of the treatment. Research into somatization could result in discovering biofeedback is a short-term therapy with long-term effects for somatization. Already we

know that it is successful with patients who need to manage chronic illnesses, as mentioned earlier. Thus, biofeedback could provide savings for the health care system by treating the enormously costly somaticizing patient.

Here are some other facts and logic to support the idea that patients may flock to clinicians who can teach them biofeedback. Psychotherapy utilization rates have remained flat over the years at less than 4% (Brown & Minami, 2010). *The Economist* (2014) reported that psychotherapy in “shrink-happy America” has declined. In 1998, 15.9% of America’s depression/anxiety cases were referred for psychotherapy. In 2007, the referral rate had dropped to 10.5% even though from 1998 to 2007 the percentage of the general population who used mental health services was stable. Thus, more mental health clients took psychotropic medication and did not partake of psychotherapy. Pharmacotherapy is usurping face-to-face therapy (Olfson & Marcus, 2010). Nordal (2010) pointed out that from 1996 to 2006, per capita expenditures for psychotropic medications tripled, accounting for 51% of spending for mental health care in 2006.

Is this helpful for patients? In a meta-analytic review, Swift, Greenberg, Tompkins, and Parkin (2017) showed that mental health patients who were offered only pharmacotherapy were 1.76 times more likely to decline treatment than those who were offered psychotherapy only. Once in treatment, patients receiving only medication were 1.2 times more likely to drop out. Clearly, patients stay in treatment if they receive psychotherapy but do not remain in drug-only treatment. Americans are not receiving their fair share of nonpharmacological psychotherapeutic care.

Despite the fact that American patients want psychotherapy, payers often refuse to recompense for it. However, patients lobby successfully in other health care cultures. For example, in the National Health System (NHS) in Britain, patients preferred psychotherapy to medication by a ratio of three to one. The NHS listened and in 2007 increased the mental health budget from 3% to 7%, mostly for cognitive-behavior therapy. Patients are demanding treatment other than pharma only. What if practitioners offer biofeedback to those who do not want pharma-cotherapy only? With a nearly zero market penetration rate described by the survey, and relatively few skilled practitioners, a nearly untouched market is open for business. If only 10% of psychologists adapted biofeedback as a routine part of practice, encouraged those who want more than just pharma to request biofeedback, clinical and financial growth could be tremendous. Clinical research can be turned into a business venture in a way that creates a win-win situation for patients, providers, and payers.

However, marketing is essential since the pharmaceutical companies or Big Pharma spent \$7.2 billion on advertising to physicians and \$4.2 billion on advertising directly to consumers for psychotropic medication in 2005 (Nordal, 2010; Silverman, 2013). It’s a David versus Goliath situation—but David eventually prevailed by using a successful strategy.

Integrated care medical homes may also want to buy into the use of biofeedback by the team psychologist as depicted in our case example. Integrated care was advocated by the Patient Protection and Affordable Care Act and other health policy makers (Oss, 2014). At the time of writing, the politics surrounding American health care are uncertain, but regardless of what health system is in play, the primary care team approach is viewed favorably. Psychologists are ideal candidates to introduce biofeedback into clin-

ical work within primary care patient-centered medical homes and thus, build mental health parity (McDaniel & deGruy, 2014; Silverman, 2013). The use of biofeedback may advance this process.

Psychologists should avoid repeating the past tragic script that played out when managed care arrived and opportunities to build practice were lost partly due to a lack of business acumen and the psychologist's ambivalent attitude toward making money (Cummings & O'Donohue, 2008). Compared with other professions financial training in behavioral health professions has been sparse. In the past, well-meaning individuals from the fields of social work, psychology, counseling, and other helping professions were not educated in the finances of health care, and thus, were not sufficiently prepared to create and adapt a successful business model. The impact of having little to no business training has been recognized and its consequences discussed (Cummings & O'Donohue, 2008). Psychologists must conduct themselves according to the basic precepts of ethical business. Britt et al. (2015) recommend that training focus on the time and value of money and budgeting. Melding the skills of biofeedback and holistic therapeutic approaches with an entrepreneurial spirit and marketing savvy will help practitioner psychologists succeed in this emerging market of global/holistic services (Austad & Gendron, 2015).

Conclusions and Call to Action

The information contained in this paper attempts to convince psychologists that biofeedback possesses great potential to benefit patients, providers, psychology and the health care system. The reasons are summarized in the following text.

Biofeedback is good for patients. Patients who learn to self-regulate, to increase control over their bodies, brains, and nervous system, and to improve flexibility and physiological responding will improve health, learning, and performance (AAPB, 2018). Biofeedback can teach a person to master stress reactivity; to self-regulate; to achieve autonomic balance, to manage stress, to enhance performance and to help achieve optimal health. Depending on their particular diagnosis, patients can manage and improve chronic disease states by managing the stress that can exacerbate medical conditions. Patients will find biofeedback to be a technologically powered tool with prophylactic powers. The client can connect how thinking and feeling affect the functions of the body and how the functions of the body affect the functions of the mind.

Biofeedback is good for psychologists and the profession of psychology. Biofeedback can enrich the therapeutic repertoire for providers when applied as a stand-alone or as a complementary intervention. It is a most appropriate tool to be used in primary care settings. Psychologists can be confident in knowing that a solid, growing evidence base underlies biofeedback. Furthermore, offering biofeedback, if marketed properly, can increase patient referrals and, thus, enhance psychologists' earning power. By doing good, psychologists can also do well. Successes in biofeedback raise the credibility of the field and enhances the prestige of the profession. By developing expertise in biofeedback, the psychologist is seen as a versatile clinician who understands both mind and body.

Biofeedback is good for the health care system. It offers a short-term, clinically and cost-effective, intervention—what patients and payers want. By supporting people in managing stress, specific chronic medical conditions, and potentially somaticizing

patients, it is an appropriate fit for the primary care delivery system. It shows how the connection between mind and body can be harnessed to treat the whole person and raise up mental health as a legitimate way of working with clients rather than being seen as a second-class field, underfunded, and struggling to achieve parity with physical treatment (Barry & Huskamp, 2011).

To promote the integration of biofeedback and psychotherapy practice psychologists should

- educate themselves to be certified experts in the practice of biofeedback;
- create programs to train clinicians to integrate biofeedback into their practices and obtain funding (e.g., grants, donors) to do so.
- sponsor and support research into biofeedback to further increase its scientific base, which could include comparing the clinical and cost effectiveness of treatment using biofeedback and more intrusive measures (e.g., pharmacotherapy);
- foster more academic programs so students train in biofeedback and such programs will spur research in the form of theses, dissertations, as well as grant-funded laboratory and clinical research;
- develop a practical framework in any curricula or training to increase awareness of diversity and cultural issues that biofeedback practitioners will encounter in the practice and research of biofeedback;
- spread the word to health practitioners, the public, and payers about the current evidence-based uses for biofeedback and market the positive aspects of biofeedback so it becomes a familiar household word;
- lobby insurers and other payers to reimburse this treatment; and
- conduct biofeedback practice according to the sound ethical business principles and market the benefits of biofeedback to professionals, patients, and payers with the belief that earnings and care can be compatible.

The profession as a whole needs to heed Belar's (1997) warning to psychologists not to give biofeedback therapy away to other professions but to assume their rightful role in providing leadership to the health care field. Because lifestyle intervention and self-help/self-care/self-regulation is at the core of effective health care, psychologists can take pride in teaching clients' to regulate themselves. To paraphrase Lao Tzu, Taoism, and a Chinese proverb: If you give a person a fish you feed that person for a day, but if you teach the person to fish, you feed the person for life. Thus, if you teach a person to use biofeedback, you help him or her to self-regulate for life.

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