Biofeedback and the Illusion of Self-Control: A Functional Contextual Perspective

Raymond C. Hawkins II, PhD
Fielding Graduate University and Psychology Department, University of Texas at Austin, Austin, TX

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Physiological self-regulation through biofeedback may be seen as a metaphor for generalized self-control expectancies. Using a model based on functional contextualism and relational frames theory, self-control efforts are seen as a convenient fiction or illusion, with physiological coherence and the sense of coherence associated with improvements in health and behavior.

While preparing a workshop reviewing theories about biofeedback change mechanisms for the 2015 Association for Applied Psychophysiology and Biofeedback (AAPB) convention (Hawkins, 2015a), I rediscovered an old paper I wrote that explored biofeedback and stress-coping training as a metaphor and illusion of self-control (Hawkins, 1980). I had trouble integrating it in the workshop because the zeitgeist had changed considerably from when physiological self-regulation and cognitive mediation models of self-control were in vogue. Recently, a conceptual framework occurred to me that may provide a bridge from this paper to a reformulation that may be better suited to contemporary applied psychophysiology research and training and therefore of interest to my AAPB colleagues.

The thesis for my 1980 paper was twofold: (a) to describe how clinical biofeedback may be seen as an overarching cognitive metaphor for self-control and generalized self-efficacy (Bandura, 1977; Mahoney & Thoresen, 1974) that might enhance a client’s overall stress-coping resources and (b) to explain how such a metaphor for self-control has its limitations as a motivator in the context of uncontrollable life events and its reality is thus an illusion to be given up and subsumed into a salutogenic (health-oriented) sense of coherence (Antonovsky, 1979) that would preserve some degree of comprehensibility, manageability, and especially meaningfulness for viewing stress and adversity. In other words, self-control is a useful metaphor for teaching physiological self-regulation skills to generalize to everyday coping situations, but ultimately, this metaphor of self-control is illusory and should be abandoned.

The zeitgeist of late 1970s biofeedback included these salient issues: (a) an emphasis on the instrumental learning of physiological self-regulation, (b) a conflict between specific and nonspecific factors in producing biofeedback effects (i.e., operant conditioning of specific physiological responses versus positive alteration of states of consciousness), (c) the important role of academic and clinical psychologists in biofeedback theory and research regarding biofeedback’s causal mechanisms, and (d) hypothesizing cognitive mediation for biofeedback’s effects (i.e., self-control theory, self-efficacy). To this list, I would add two other influential ideas: Antonovsky’s (1979) salutogenesis (sense of coherence theory) and the renaissance of spiritual/religious themes within academic psychology (e.g., the Bergin-Ellis debates of 1980 in the Journal of Consulting and Clinical Psychology; Bergin, 1980a, 1980b; Ellis, 1980).

The 21st-century zeitgeist within AAPB emphasizes specific neuroscience systems and neurofeedback (e.g., neuroplasticity, neuroconnectivity, neuroregulation, and neuromodulation rather than physiological self-regulation and self-control), with a decreased emphasis on cognitive mediational learning and less involvement of academic clinical psychology graduate training and research in biofeedback. However, just as Antonovsky’s (1979, 1987) sense of coherence theory could be used as a meta-level conceptual framework for stress-coping training in the 1970s and 1980s, McCraty’s (2010) conceptual model of physiological coherence stemming from his heart rate variability (HRV) research program at the Heart Math Institute may serve as a bridge between 21st-century applied psychophysiology and clinical health psychology (e.g., the current great interest in the nature and clinical applications of mindfulness and compassion training).

Lest readers jump to the conclusion that the old zeitgeist is irrelevant for today’s biofeedback practitioner, I would like to call attention to the excellent YouTube video of the interview of Erik Peper by Larry Berkelhammer (Berkelhammer, 2012) titled “Biofeedback Builds
Self-Efficacy, Hope, Health, & Wellbeing.” Here, Peper explicitly states that success in physiological self-regulation (through biofeedback) allows the client to reframe the illness from being structural (“I can’t do anything about it”) to functional (“Here’s how my biology may be creating or supporting this symptom, and if I change it—which I have now demonstrated that I can through biofeedback—then all of a sudden I feel hope, and hope is a sense of empowerment.”). Then he illustrated this point with an anecdote about showing a 7-year-old girl with migraines how to warm her hands by his self-demonstration before she was willing to warm her own hands:

She no longer believed it was possible: She knew that it was possible. And that’s the distinction: We forget that it’s in the knowing that we develop competence. So we don’t teach children and adults how to develop self-esteem, we teach them the skill acquisition by which they now know that they have worth and value. I don’t know any other more effective tool for doing this than biofeedback—the machine can show you graphs and numbers that are indisputable. It’s so powerful.

Interestingly, Berkelhammer and Peper intimated that this demonstration is more powerful for male scientists, but then Peper speculated that it is also influential for the “softies or soft-science types” because “it can show hope” (i.e., by seeing the impact of thoughts and worries on the physiological response and the reduction of the response through breathing and relaxation skills training, as he described in the case with a woman with hypertension): “We are no longer powerless, we can do something.” Berkelheimer then concluded, “And that builds self-efficacy and self-empowerment, and in doing that we improve our quality of life dramatically.”

The themes of Peper’s interview (“biofeedback builds self-efficacy, hope, health, and wellbeing”) paint a pretty picture that challenges us to reconnect with the popular appeal and promise of biofeedback from its inception in the late 1960s and 1970s: the demonstration that one’s thoughts and feelings affect one’s physiology and that learned control over one’s psychophysiology is possible and can serve as a metaphor of self-control. Furthermore, the comprehensibility and meaningfulness that Antonovsky (1979, 1987) proposed in his “salutogenesis” and “sense of coherence” concepts may also be enhanced as an accompaniment to the biofeedback facilitated manageability of one’s psychophysiology. Although some empirical studies support the claim that biofeedback enhances self-efficacy (e.g., Seng & Holroyd, 2010; Teufel et al., 2013), there is a need for more research to demonstrate that such enhanced self-efficacy from biofeedback mediates improved clinical outcomes (e.g., French, Gauthier, Roberge, Bouchard, & Nouwen, 1997). Clinical biofeedback experience suggests that the sense of coherence is also enhanced by successful biofeedback, but there is a need for more research to substantiate this claim.

The potential relationships among physiological coherence, mindfullness, and the sense of coherence would be a fruitful area for biofeedback research to test the reformulated “illusion of control” model that I shall now present, which is based on functional contextualism and relational frames theory (Hayes, 2004; Hayes, Barnes-Holmes, & Roche, 2001).

The Illusion of Control Reformulated Within Functional Contextualism and Relational Frames Theory

Stephen Hayes (2004) pioneered the development of acceptance and commitment therapy (ACT), which he calls a “3rd Wave” theory (the first two waves being behaviorism and cognitive-behavioral therapy, respectively) in that it challenges the preeminence of cognitive mediation (i.e., irrational thoughts or constructs such as self-control) and efforts to teach clients to control their thinking and behavior to reduce their symptoms and disorders. ACT instead helps clients to accept their experiences as they are, rather than to try to control or avoid them (i.e., to decrease experiential avoidance). Additional steps in ACT include mindfulness training as well as experiential exercises to help clients recognize how their cognitive frameworks (i.e., verbal rules) have made them stuck in these control efforts and how they can defuse their “fused thoughts.” As this mindfulness and cognitive defusion increase, one becomes more capable of acting with psychological flexibility and commitment (the “C” in ACT) to one’s values rather than being limited by symptoms. Psychological flexibility is also associated with decreased defensiveness and improved object relations (Salande & Hawkins, in press).

ACT is based on functional contextualism. Hayes et al. (2001) define functional contextualism as viewing the ongoing act in context (Pepper, 1942). This includes: (1) a focus on the whole event, (2) sensitivity to the role of context in establishing the nature and function of an event, and (3) a firm grasp on a pragmatic truth criterion. (p. 6)
For biofeedback, this context includes the interaction of the client with the biofeedback/neurofeedback apparatus, the encouraging technician/therapist, and the concurrent events in the client’s life.

A second formative process, related to functional contextualism, is relational frame therapy (Hayes et al., 2001). A relational frame is in effect a context that functions to initiate and maintain a response in relation to an equivalence class (which is typically a verbal rule). For example, in Peper’s video interview, the woman with the hypertensive blood pressure (BP) that spikes when she thinks worry thoughts (e.g., “I can’t do it. I can’t control it.”) sees the biofeedback instrument register this spike. Then, in the context of the support and guidance of Peper and the biofeedback, she learns to reduce her pressure readings. She gets excited, saying, “I can do it.” Peper in the interview actually called this “reframing.” In terms of relational frame theory, the functional context of the first relational frame (“I can’t control it” associated with worry and high BP) is changed to the second relational frame (“I can do it” associated with no worry and lower BP). The change in relational frames can be quite sudden. Visdómine-Lozano (2015) has provided a more technical account of reformulating generalized control expectancies using relational frame therapy. With this reframing, both physiological coherence and sense of coherence are likely to increase, along with hope, health (“salutogenesis”), and well-being as described in the interview. The client is also likely better able to balance her sense of agency and communion (Bakan, 1966), i.e., both to self-initiate and also to ask for help from others when appropriate. However, if the client tries to control her physiology, thoughts, emotions, and life experiences rather than let go and accept them, she may experience difficulty. This would be an example of the illusion of control.

I have developed a transtheoretical system contextual integrative model (SCIM) for guiding psychotherapy assessment and interventions (Hawkins & Meier, 2015), based on an elaboration of Angyal’s (1965) dual-process personality theory contextualized within social ecological levels. In terms of Hayes et al.’s (2001) relational frame theory, the dual process in Angyal’s model and in the SCIM involves a healthy system principle frame (“healing cycle” within SCIM) and a neurotic system principle frame (“trauma cycle”), which are conceptual terms to describe the functional context within which pathogenic and salutogenic behaviors, thoughts, values, and relationships are ordered. Within the healing context frame (such as seen in Peper’s interview and anecdotes about his interactions with his clients), there is an interpersonal-emotional-physiological letting go that supports increased psychological flexibility and coherence (Hawkins & Meier, 2015). I believe that coherence is an emergent concept that exists in parallel at the physiological level from the bottom up (e.g., McCraty’s HRV coherence) and form the top-down level of motivated behavior and consciousness (e.g., Antonovsky’s sense of coherence).

The SCIM theory also posits that individual and cultural differences likely characterize and modulate the alternating frames of the healing cycle and trauma cycle. At the level of the person, Peper’s and Berkelhammer’s dialogue in the YouTube video speculated how two different types, both the “hard” scientist (stereotypically male) and the “soft” scientist (stereotypically female), might benefit from biofeedback but in different ways: The hard scientist would find the data showing acquisition of physiological self-regulation to be convincing whereas the “softie” would experience this as more “hopeful.”

**Conclusion**

In this essay, I have situated an old notion of the metaphor and illusion of self-control that was developed during the days when nonspecific cognitive mediational models of biofeedback were in vogue (Hawkins, 1980, 2015, AAPB Workshop) within a contemporary functional contextualist relational frame theory network that is used to highlight the anecdotes of Peper in his video interview (Berkelhammer, 2012). My hope is that this reformulation will spark the interest of biofeedback practitioners and researchers to gather more evidence to test the usefulness of this metaphor and illusion of self-control in promoting hope, health, and well-being in our clients and in ourselves.

**References**


Correspondence: Raymond C. Hawkins II, PhD, The University of Texas at Austin, 108 E. Dean Keeton A8000, Austin, TX 78712, email: rhawkins@utexas.edu.