

*It was assumed by many early biofeedback researchers that conditioning was the **only** explanation for learning processes underlying control of the autonomic nervous system. As we have noted, the Greens did not find themselves in agreement with this position. Instead, their focus was on “voluntary control,” a term more akin to information theory explanations of feedback processes than conditioning theory. Information theory is a scientific model that was emerging at about the same time as the development of biofeedback, and is of equal respectability. From a **clinical** standpoint, their work was in line with “self” conceptions and theoretical and practical notions of the “will” as seen in Psychosynthesis, developed by Roberto Assagioli, a contemporary of Freud and Jung. Voluntary control, or conditioning. . . Why does it make a difference? What are the implications of the difference between these competing theoretical understandings? The following selections help to spell out how the Greens thought about these issues. [Eds.]*

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## **BIOFEEDBACK: RESEARCH AND THERAPY**

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### **VOLUNTARY CONTROL, OR CONDITIONING**

**I**n the foregoing review of biofeedback training for control of physiological functions we have stressed research that involves conscious, aware, voluntary control in humans. There is debate, however, as to whether biofeedback learning should be thought of as conditioning, or voluntary control, and the work in operant conditioning, with animals, as exemplified by the studies of Miller and his associates, and with humans, in the studies of Shapiro and Schwartz and their associates, merits discussion. In the early sixties Miller challenged the then prevailing view that operant conditioning was possible only in the cerebrospinal system, and that the autonomic nervous system could be modified only through classical conditioning. In 1965 he and DiCara undertook to demonstrate that there was “no real difference in these two kinds of learning,” by training curarized rats (paralyzed through the administration of curare to eliminate the effects of skeletal responses on visceral responses) to increase and decrease their heart rates (1967). The reinforcer used was electrical stimulation of the “pleasure center” in the brain. The experiment was successful. Following the same paradigm, Miller and DiCara later

conditioned blood pressure, intestinal contractions, rate of formation of urine, and blood vessel diameter in curarized rats (1969).

Describing biofeedback procedures as “operant conditioning” prevails among many researchers studying the possibility of autonomic control in humans. It fits the Zeitgeist. Shapiro and Schwartz have expressed preference for the conditioning paradigm because they say it adds precision to the design and analysis of experiments (1972). Since scientific exactness is commendable the question must be raised as to whether it is possible to reflect (with precision in design and analysis) the richness and uniqueness of human experience without modifying the procedures and concepts developed through many years of animal research. . . .<sup>1</sup>

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#### REFERENCES & NOTES

1. An early paper submitted for publication was returned for clarification partly because it did not state the “conditioning” procedure used. The phrase “operant self-conditioning” (which we feel is a contradiction in terms) was added and the paper was published.

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