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This Week's Citation Classic

Katkin E S & Murray E N. Instrumental conditioning of autonomically mediated behavior: theoretical and methodological issues. Psychol. Bull. 70:52-68, l968.. [Dept. Psychology, State Univ. New York, Buffalo, NY]

This paper reviews the empirical literature on instrumental conditioning of autonomic responses and raises a number of questions concerning the theoretical mechanisms by which such conditioning occurs. It concludes that voluntary control of autonomic functions cannot be understood within the context of operant theory. [The Social Sciences Citation Index® (SSCI®) indicates that this paper has been cited over 125 times since 1968.]

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"This paper emerged from the frustration that the late Neil Murray and I experienced in trying to replicate the first few experimental reports of operant autonomic conditioning that were emanating from Shapiro's[1] laboratory at Harvard and Kimmel's[2] at Florida. After poring over the few reports of the phenomenon that existed at the time (this was before N.E. Miller[3] hit the scene with his dramatic —and not so replicable — reports on curarized rats), we decided with great anxiety that our data were OK, but that the discrepancy between our laboratory and the others was a result of interpretation rather than experimentation. The phenomenon of acquired autonomic control was an incontrovertible fact, but the proper theoretical explanation of its mechanism, we felt sure, was entirely beyond empirical resolution. The only thing we felt confident about was that the then popular tendency to describe the phenomenon as instrumental conditioning was unwarranted on the basis of the available evidence.

"Neil and I went into a frenzy of writing in the spring of 1967, but no sooner had we finished our first (enormously overwritten) draft of the paper when Kimmel's[4] review of the field appeared in the Psychological Bulletin!. We were stunned. Although we had written a paper that was entirely different in theme and purpose from Kimmel's, we felt sure that the Bulletin would not publish two reviews of the same literature within a year. Panicky, we wrote to the editor to tell him of our plight, and to inquire if we should proceed to polish (i.e., reduce the shameful glut of words) the manuscript for submission, or just forget the entire affair and return to clinical psychology from whence we had come.

"The editor encouraged us to submit the paper, and we did. Shortly thereafter we received a letter of rejection, along with a scathing denunciation by an anonymous reviewer, in which our intellect, integrity, training, and academic credentials were called into question. The review was so unprofessional and so clearly ad hominem that we were convinced at first that it was a practical joke, but it was not. Had the anonymous reviewer merely written a coherent rejection, we might have buried the paper and contented ourselves with trying to persuade our friends and students of the wisdom of our view, safe from the scrutiny of the outside world, but the reviewer had declared war on us. He demanded a reply! We requested from the journal an additional, independent review of the paper. We received a thoughtful (i.e., positive) review the second time around, and the paper was published (after more reductions) and widely read. Among the many readers of the paper, needless to say, there have been some who have called into question our intellect, integrity, training, and academic credentials.

"The high frequency with which this paper has been cited is undoubtedly related to its role in the subsequent development of theory and practice in biofeedback, for which I apologize.

"During the 1970s, literally hundreds of papers appeared in the areas of self-regulation and biofeedback. An annual volume on consciousness and self-regulation serves to summarize much of this research."[5]

1. Shapiro D, Crider A B & Tursky B. Differentiation of an autonomic response through operant reinforcement. Psychon. Sci. 1:147-8, 1964.
2. Kimmel H D & Baxter R. Avoidance conditioning of the GSR. J. Exp. Psychol. 68:482-5, 1964.
3. Miller N E & DiCara L. Instrumental learning of heart rate changes in curarized rats: shaping and specificity to discriminative stimulus. J. Comp. Physiol. Psychol. 63:12-19, 1967.
4. Kimmel H D. Instrumental conditioning of autonomically mediated behavior. Psychol. Bull. 67:337-45, 1967.
5. Schwartz G E & Shapiro D, eds. Consciousness and self-regulation: advances in research and theory New York: Plenum, 1978. Vol. 2.