

*William T. Powers:
Biographical sketch, CV, and Publications*



Biographical sketch

From http://www.livingcontrolsystems.com/authors/about_powers.html

William T. Powers provided this autobiographical sketch in July, 2006:

I was in the Navy from age 17 to 19 (1944 to 1946), which is where I learned electronics, had my first experiences with repairing and maintaining various kinds of servomechanisms, and learned some basic feedback theory. I went into college in 1947 and graduated from Northwestern U. in 1950 with a BS in physics and mathematics. Then in 1952 after bumming around for a while in dianetics and working in a television manufacturing company, I went to work as a junior health physicist at the Argonne Cancer Research Hospital at the U of Chicago, where I learned some more about control systems. That's where I was when Bob Clark (whom I had known from dianetics and who was working with me on a feedback model of behavior) had an offer to start a new health physics department at the VA Research Hospital in Chicago, and in 1953 managed to get me a position there developing electronic systems for medicine, with half of my time supposedly free to work with control models of behavior. Bob MacFarland was chief clinical psychologist there. That's where I learned about analog computing (Philbrick) and had my first experiences programming a digital computer (IBM 650). I designed an automatic underwater isodose tracing system for a rotating Cobalt-60 therapy machine, using an analog computer as the control system. The late John Chancellor of NBC interviewed me about it. In 1960 I was first author of the paper in *Perceptual and Motor Skills* on "feedback theory" with Clark and MacFarland, and we split up when MacFarland advised me I had done about all I could and should turn the control theory project over to people with PhDs, meaning him and Clark. I said goodbye and decided to try to get my own PhD.

I knew Donald Campbell by then, and through him got a scholarship to enter graduate school in psychology in 1960 at Northwestern, where he taught. But I left after one year because my proposed Masters Degree thesis, involving control by rats, was not acceptable to the Spencian psychologists then in charge. Note that this was 10 years after I got my BS.

After I left the graduate school I went to work at Dearborn Observatory at Northwestern (I had worked there in my undergraduate years to supplement the GI Bill). While there I designed and built low-light-level television systems for astronomy, and designed and built a semi-automated observatory in New Mexico, used for successful supernova searches and other things. I also designed and built an all-sky survey photometer for use on the Moon in connection with Apollo 18, which was canceled (17 was the last one). And in my spare time, I worked on the manuscript which became B:CP 12 years later. Don Campbell, by the way, was instrumental in getting Aldine to publish it. He understood exactly why I had left the graduate school, and said I had done the right thing.

When B:CP [Behavior: The Control of Perception] came out in 1973 I resigned from the observatory (astronomy was then in a period of decline with the end of the Apollo era) and sought to make money by consulting (and producing a board game, Trippples, which you can Google). After five years of giving seminars and publishing papers on feedback theory and using up Mary's and my savings, I took a job at the Chicago Sun Times working as a technician on their editorial computer system. I got the Marshall Field Award for developing a microcomputer system for receiving the stock market tables by satellite and automatically formatting them and sending them to the phototypesetter. We had stock tables on the streets three hours before any other newspaper in Chicago had them, including the Tribune, our arch-rival (hence the award). I worked there from 1978 until I retired in 1990. The CSG [Control Systems Group] was formed in 1985, so my two lives overlapped there, too.

CV From *Dialogue*, page 178, i.e. letter from Powers to Runkel July 30, 1986.

VITA - William T. Powers
as of July 30, 1986

Education: BS (Physics), Northwestern Univ. 1950.

1 yr Grad Sch. of Psych, Northwestern (1960, no deg.)

Employment:

1979 – present: Systems engineer, technical services Dept., The Chicago Sun-Times. Developed microcomputer system for receiving, formatting, and typesetting stock tables (Marshall Field Award received for this project). Currently working on system for receiving newsprint manifests by wire. In spare time, as for the past 35 years, worked on developing a control-system model of human behavior (see publications list).

1974-1979: Independent consultant in control electronics; writing and research on behavioral model. Principal client, Diffraction Products, Inc., Woodstock IL. Devised control systems for laser-controlled diffraction-grating ruling engine. System currently producing the most precise gratings in the world.

1960-1973: Chief systems engineer, Department of Astronomy, Northwestern University. Designed and built low-light-level television systems for astronomy. Helped design Lindheimer Astronomical Research Center. Designed and built Corralitos Observatory, including building, telescope controls, computer controls, and semi-automated supernova search program. Designed and built automatic all-sky photometer for use on moon (Apollo 18, which never flew). Started part-time while attending graduate school in psychology.

1953-1960: Medical physicist, VA Research Hospital, Chicago, IL. Designed many devices for medical research. Principal item, a curve-tracer for plotting isodose contours in beam of radiation from Cobalt-60 therapy machine. Also in charge of radiation safety.

1952-1953: Junior medical physicist, Argonne Cancer Research Hospital, Univ. of Chicago.

Publications in psychology:

1957

Powers, W.T., Clark, R.K., and McFarland, R.L.; A general feedback theory of human behavior. Counseling Center Discussion Paper *III*, No. 18, 1957 (University of Chicago).

Powers, W.T., Clark, R.K., and McFarland, R.L.; A general feedback theory of human behavior: a prospectus. *American Psychologist* 12, p. 462, 1957. (Abstract of paper given before APA meeting).

1959

McFarland, R.L., Powers, W.T., and Clark, R.K.; A preliminary report on a clinical rating scale ... derived from a hierarchical feedback model. *Newsletter for Cooperative Research in Psychology* 1, No. 4, 1959. Baltimore VA Hospital.

1960

Powers, W.T., Clark, R.K., and McFarland, R.L. (1960). A general feedback theory of human behavior. *Perceptual and Motor Skills* 11, 71-88 (Part 1) and 309-323 (Part 2). 1960. Both parts reprinted in *General Systems* V, 63-83, 1960.

Part reprinted in Smith, A. G., *Communication and Culture*, New York: Holt, Reinhart, and Winston (1966).

1971

Powers, W.T. (1971). A feedback model for behavior: application to a rat experiment. *Behavioral Science* 16, 558-563.

1973

----- (1973). Feedback: Beyond behaviorism. *Science* 179, Jan. 26, 351-356.

Baum, W., Reese, H. W., and Powers, W.T.; Feedback and Behaviorism. Exchange of letters in *Science*, 179, 351-356, 1973.

Powers, W. T.; Behavior: The control of perception. Chicago: Aldine (1973). Now published by Walter de Gruyter.

1974.

----- Applied epistemology. In *Epistemology and Education*, Smock, C., and von Glasersfeld, E. (Eds). Univ. of Georgia Follow-through program. Dept of Psychology, Univ. of Georgia, Athens, GA.

----- Degrees of freedom in social interaction. in *Communication and Control in Society*, Krippendorff, K. (Ed)., 267-278. New York : Gordon and Breach: 1979. Paper before American Society for Cybernetics, 1974.

----- Some cybernetics and some psychology. *Cybernetics Forum*, 6, 4-9, Winter, 1974.

Bohannon, P., Powers, W., and Schoepfle, M.. Systems conflict in the learning alliance. In *Theories for Teaching*, Stiles, L.J. (Ed). New York: Dodd, Mead (1974).

1975

Powers, W.T. *The logic of social systems*. by A. Kuhn (book review). In *Contemporary Sociology*, pp. 92-94, March 1975.

1976

----- Feedback theory and performance objectives. *Journal of Psycholinguistic Research* 5, 285-297, 1976.

----- The cybernetic revolution in psychology. *Cybernetics Forum* 8, 72-76, Fall-Winter 1976. Paper given before APA in Washington, D.C., Sept., 1976.

----- Reply to Katz' analysis. *Cybernetics Forum* 8, 143-146, Fall-Winter 1976. Accompanied paper by Katz, S.; The theory of knowledge in Powers' model of the brain.

1978

----- Feedback principles in behavioral organization. In *The Psychology of the 20th Century Vol 5: Pawlow und die Folgen*, Zeier, H., (Ed.). Zurich: Kindler-Verlag (1978). In German by translator.

----- Quantitative analysis of purposive systems. *Psychological Review* 85, 417-435, 1979.

----- The nature of robots: *Byte Magazine* 4.

Part I: Defining Behavior. June, 132-144.

Part II: Simulated Control Systems. July, 134-152.

Part III: A closer look at human behavior. Aug. 94-116.

Part IV: Looking for controlled variables. Sept. 96-112

----- A cybernetic model for research in human development. in Ozer, M. (Ed.); *A cybernetic approach to the assessment of children: Toward a more humane use of human beings*. Boulder, CO: Westview, (1979), pp. 11-66 .

----- A systems approach to consciousness. in *The Psychobiology of Consciousness*, Davidson, J. and Davidson, R. (Eds). 217-242. New York: Plenum (1980).

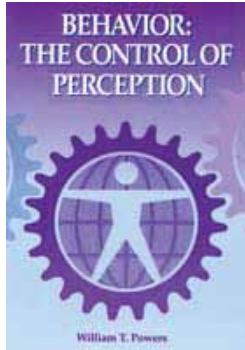
Also publications in astronomy in 1962, 1963 (2), 1964, 1966, 1970, 1972.

In computing:

Weller, W., and Powers, W.; *An Editor-Assembler, System for 8080/8085 - based computers*. Chicago: Northern Technology Books (1978).

Books by Powers.

As featured at www.livingcontrolsystems.com/files/books_videos.html



Behavior: The Control of Perception

"Powers' manuscript, *Behavior: The Control of Perception*, is among the most exciting I have read in some time. The problems are of vast importance, and not only to psychologists; the achieved synthesis is thoroughly original; and the presentation is often convincing and almost invariably suggestive. I shall be watching with interest what happens to research in the directions to which Powers points." —Thomas S. Kuhn

"Here is a profound and original book with which every psychologist—indeed every behavioral scientist—should be acquainted. It is delightful to have a person of such varied and unorthodox background come forth with a unique theory of the way in which behavior is controlled in and by the individual, a theory which should spark a great deal of significant research."—Carl R. Rogers

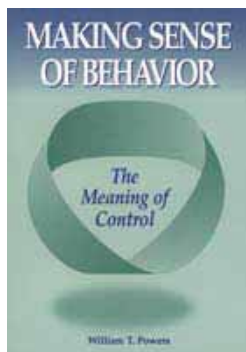
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Behavior: The Control of Perception—Chinese

At the end of 2002, we found the book *Behavior: Control of Perception* by William T. Powers. After close reading of the book, we hold that Powers' PCT is a further development on the basis of Wiener's classical cybernetics, and with many innovations in theory and practice, is superior to the latter in the delicate illustration of the control mechanism scheme, in the creation of the new concept about purpose, that is, reference signal, in the hierarchy of the control of human perception, in its application in biology, computer science and cognitive science, and so on. — *President Yan Zexian and Fan Dongping*, Professors, Philosophy, South China Normal University; *Zhang Huaxia*, Professor, Philosophy, Zhongshan University.

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Making Sense of Behavior — The Meaning of Control

For almost a century, it has been the custom among American psychologists to seek to understand human nature by watching what people *do*. Most books about human nature focus on human doings; they focus on nameable acts with beginnings and endings. Consider a television set. What does a TV do? It shows us moving pictures on its screen; that is the "behavior" we see. But we could spend an entire lifetime studying the action on the screen and never come to understand a thing about how a TV functions. This book does not focus on visible acts. It focuses on perception. It shows us how action comes about if and only if we find a discrepancy between what we are experiencing and what we want to experience. — Philip J. Runkel.

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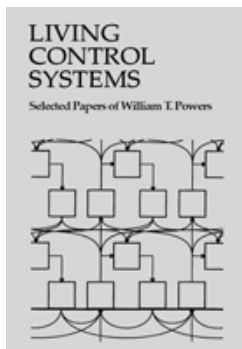


Living Control Systems III — The Fact of Control

"Living Control Systems III continues Powers' revolutionary approach to understanding living organisms as purposeful agents whose actions serve to control their environments. A unique feature of the book is the accompanying computer programs where Powers 'puts his models where his mouth is,' graphically demonstrating how negative feedback control systems can account for a wide range of goal-oriented behavior. This book is required reading (and computing) for anyone seeking a deep understanding of the behavior of living organisms."

— Gary Cziko, Professor Emeritus, University of Illinois

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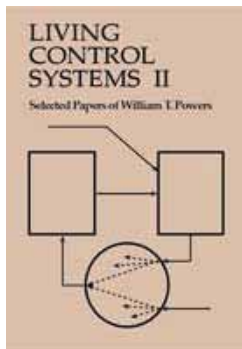


Living Control Systems

14 previously published papers, 1960-1988.

The control theory viewpoint has gained many supporters in recent years because of its rigor, its beauty, and its explanatory abilities. This viewpoint was first developed by William T. Powers in the papers in this book.

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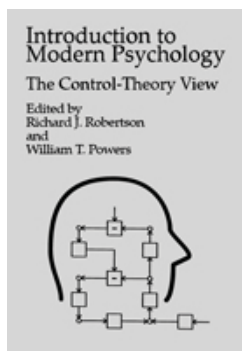


Living Control Systems II

22 Previously unpublished papers, 1959-1990.

Powers critiques the theories of mainstream behavioral scientists, showing how their defects are avoided by applying control theory instead. He also demonstrates the need for truly generative models if a genuine science of living control systems is to be developed.

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Introduction to Modern Psychology The Control-Theory View

Suitable as the primary text for introductory college-level psychology courses and for independent study, this textbook provides a unified approach to the entire field of psychology, from laboratory studies of animal behavior, through ethology and studies of human social behavior, to clinical work.

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