

The PCT view of Behavior William T. Powers

Behavior is a process of an organism's controlling what happens to itself, to the extent physically possible. This assertion, based on Perceptual Control Theory or PCT, is a direct contradiction of the basic principle on which the sciences of life, ranging from biology to neurology to psychology to sociology, were founded.

According to the most widely-accepted view, science does not permit the assumption that an organism is an agent capable of initiating action. Instead, it is assumed that in one way or another, direct or indirect, the environment and the physics and chemistry of living tissue determine behavior. Ultimately, the causes of behavior are the same whether we speak of inert matter or living matter. The ingredients of life, Carbon, Hydrogen, Oxygen, and Nitrogen -- C, H, O, N -- have no more capacity, individually or in combination, to be aware or behave spontaneously than do Copper, Helium, Osmium, and Neodymium -- Cu, He, Os, Nd.. This is the creed of the sciences of life, taken just as seriously and just as much without proof as any religious creed.

If the accepted scientific view is correct, then the organism typing these words is performing each movement because of external influences tempered by that organism's inherited internal construction. There is typing going on, but there is no person, no self, no aware entity, doing the typing. There are no ideas to be typed, no principles to be discussed, no purpose in being occupied with a keyboard. Science does not recognize a dualistic organism. Therefore, if the accepted scientific view is correct, PCT is wrong.

However, the converse is also the case. PCT is based on the engineering concept of negative feedback control. The idea that behavior is a process of control is based on purely scientific principles and findings. The existence theorem of negative feedback control says that a system can act on its environment in such a way as to bring the inputs to that system to internally selected constant or varying values, at the same time defending those inputs against external influences. The mathematical analysis of such systems is well known. Artificial examples of such systems abound. In all respects relating to the variables controlled by such devices, it is the device that determines what effects the environment will and will not have on it, and further, what effects now in existence will be changed in amount and direction. All evidence currently available says that all organisms exert negative feedback control at all levels from the cerebral to the cellular to the chemical. And for at least one species, all evidence supports the idea that the organism is aware of at least some of what is going on.

Control has physical limits which can be exceeded by environmental disturbances. But what the organism does about such an event is to reorganize either to increase its ability to nullify the effects of such disturbances or avoid being exposed to them. The internal organization of a living organism is under its control at the functional and the physiological level. It seems quite likely that even at the level of DNA, life is in control of its own evolution: it alters its own genes as a way of becoming immune to selection pressures, even when this entails changing itself from one species into another.

If PCT is correct, then the sciences of life have been wrong from the start about the fundamental nature of living systems. That is the main barrier to acceptance of PCT, and if PCT is correct, its main future contribution to our understanding of organisms.