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## Systems theories

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## Systems theories

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## **Type of psychology:** Psychological **methodologies**

*Systems scientists in the natural and social sciences study the interaction between the parts of a system rather than the parts in isolation to better understand the complexity of reality. Systemic thinking has influenced psychological theory and practice, as many subfields in psychology such as industrial and organizational psychology, ergonomics, and family systems theory share the systems perspective.*

### **Introduction**

Systems theories provide a general framework for the integration of different fields in science. They are, in essence, theories of organization. Until the beginning of the twentieth century, science was dominated by a reductionist viewpoint. Scientists believed that the way to understand something was to take it apart and see what it was made of. After a while, however, all they were left with were molecules. Systems thinking provided another way of looking at the world that better accounted for its complexity. Instead of trying to understand something by studying it in isolation, scientists looked at what types of patterns emerged when elements interacted. Thinking in terms of systems greatly increased after World War II and occurred independently in different parts of the world, thus creating systems science. Influential figures in the development of modern systems thinking include William Ross Ashby, [Gregory Bateson](#), and Kenneth Boulding. In 1945, biologist Ludwig von Bertalanffy formalized general systems theory.

According to systems theorists, reality is a hierarchy of interconnected systems of higher and lower orders. For example, the cell, which is a system on its own, is part of the human body system, which is part of a social system, which is a part of the planetary system, which is a part of the solar system. What all these systems have in common is the way they are organized. They possess general system characteristics, regardless of whether the system is physical, biological, psychological, or social. They may look different, but they all obey the same rules. They all share similar structures and functions.

The structure of a system refers to the way its elements are interrelated. It can be seen as the “program” that determines how elements interact together, or its design. The function of a system refers to what the system is “designed” to do. Some systems are characterized by their tendency to maintain steady states or equilibrium. In this sense, systems appear to be goal-oriented. Systems that achieve a certain balance are said to be self-stabilizing, or self-regulating. One way systems can achieve this stability

is via the structure of feedback loops, where information from one part of the system is fed to other parts and back again, creating a continuous flow of communication. This allows the system to adjust by comparing its current state to a “desired” state. This particular type of systems theory, cybernetics, was introduced by Norbert Wiener in 1948. The thermostat is an example of this type of system.

Many different systems theories exist, with applications in physics, chemistry, biology, psychology, sociology, and other fields. Regardless of the specific field of study, scientists find that many different types of phenomena can be categorized under the same “system” umbrella. Because many systems work in essentially the same way, knowledge can be transferred from one field of study to another. In a sense, different fields of study provide different examples of the same types of systems.

### **Systems Theories and Psychology**

Many psychological theories have been inspired by systems thinking. These include ecological systems theory, cognitive systems theory, and field theory. Fields of applied psychology such as [ergonomics](#), [industrial and organizational psychology](#), and family systems therapy also adopt a systemic perspective. What all these psychological theories and approaches have in common is that they all take a step back and observe how dynamic interaction produces observable behavior. For example, a work environment, a family, and an individual can all be considered systems at different levels. In seeking to solve problems, systems psychologists consider the impact of each of these elements on the functioning of the entire system. They consider, as expressed in [Gestalt psychology](#), that the whole is different from the sum of its parts. Indeed, a human being cannot be adequately represented if reduced only to a body plus mental functioning.

By studying what is common in the way elements of physical, biological, social, or other types of systems interact to create a whole, systems scientists are able to get a clearer view of the big picture. This holistic perspective allows scientists to continually uncover general patterns in nature and ultimately arrive at unifying principles of science.

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