Encyclopedia of Social Theory

General Systems Theory

Contributors: Kenneth D. Bailey
Edited by: George Ritzer
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The goal of general systems theory (GST) is to model the properties and relationships common to all systems, regardless of their specific components, or the academic disciplines in which they are studied. Thus, while physical, biological, or social systems may appear to be quite different in terms of their components and relationships, they all may display certain common properties. The study of these common properties is the goal of GST.

A system is defined as a bounded set of components and the relationships among them. Generally, the internal components of the system are assumed to be interrelated in such a manner that when the value of one of the components is changed (for example, by an external force), the value of one or more of the other components also changes, often in such a way as to offset the effects of the externally induced change.

Basic Definitions

Components

System components are the internal entities that are located within a system's boundaries and which are interrelated. The system components are generally assumed to be of the same basic nature, but there may be occasional exceptions to this rule. For example, in social systems, the human individual is often (but not always) chosen as the basic system component. Other hierarchical social levels, such as the group, organization, or society, could be chosen alternatively as system components. System components are often referred to alternatively as system units, with the words often being used interchangeably.

Concrete and Abstracted Systems

Systems in which the internal units are empirical objects, such as living organisms or mechanical entities, are often referred to as concrete systems. One of the most fundamental concrete social systems is the family. The components or units of the family system are the individual family members, who are related to each other in a specific way. Other examples of concrete living systems would be an ant colony or a pod of pilot whales. Concrete systems may be referred to by a variety of names, such as physical systems, empirical systems, “real” systems, biological systems, social systems, or veridical systems.

Not all systems are concrete systems. The components of some systems may be concepts, theoretical terms, variables, or abstract symbols. Such systems are called abstracted systems. Other names for them are abstract systems, theoretical systems, conceptual systems, or symbol systems. As with concrete systems, abstracted systems are comprised of a set of interrelated components. However, abstracted systems differ from concrete systems in at least two ways. In abstracted systems, the components are nonempirical entities such as concepts or variables. Secondly, in an abstracted system, the boundary may not be visible or empirically determinable. While concrete systems are generally situated in physical space-time, abstracted systems may be situated in analytically constructed space, such as “social space” or “psychological space.” Some examples of components for abstracted systems are the social role, the unit act, or the concept.

While abstracted systems and concrete systems exist in different spaces, they are not necessarily completely unrelated. For example, the definitions of the abstracted system and the concrete system can be used to illustrate the relationships between a social position (such as a status or role) and an incumbent. A concrete statement would state that “George W.

Bush is the president of the United States." Here the emphasis is not on the office or role of president but is on the concrete individual (George W. Bush). The parallel abstracted statement would state, "The presidency is occupied by George W. Bush." Now the emphasis is on the abstracted role (the presidency) and not on the concrete individual who is temporarily occupying it (George W. Bush). Indeed, the abstracted social structure, such as the system of unwritten roles in a bureaucracy, while existing in "social space," may have more longevity than the concrete individuals who may occupy the respective positions only a short time. Thus, the abstracted social system (of roles) may be semipermanent and long lasting, while the concrete social system (of specific individuals) is limited by the life span of the particular incumbent.

Open and Closed Systems

Systems have been traditionally dichotomized as being either "open" or "closed." The extreme case of a closed system is a so-called "isolated" system. In an isolated system, the boundaries are totally closed and impermeable, so that the system is totally isolated from its surrounding environment. Such an isolated system does not permit flows of either matter-energy or information across its boundaries. Thus, an isolated concrete living system is, over time, potentially unsustainable, as the internal components of the system are deprived of the necessary materials such as energy (food or fuel) that are needed to sustain life.

In contrast to closed or isolated systems, social systems are generally viewed as open systems. Open systems have boundaries that are open to flows (inflows, outflows, and through-flows) of matter-energy and information. For example, consider a social system such as a manufacturing plant. This organization generally has inputs of matterenergy in the form of raw materials (for example, wood) and outputs of finished products (for example, chairs). Its boundaries are open to both inputs and outputs.

The classical open/closed system dichotomy is inadequate for the analysis of modern social systems, because many systems are alternatively open and closed. The social system typically does not leave its boundaries either permanently opened or permanently closed. In reality, the social system opens its borders to inflows of energy and information that it needs to function properly, and closes them to energy and information flows that could impede its functioning. The boundary of the modern social system must serve as an efficient screen to prohibit the input of harmful or inferior matter-energy or information while facilitating the input of necessary or useful matter-energy or information.

It is a misnomer to term a social system *open* if this implies that the system is always open. A social system with perpetually open boundaries would have great difficulty surviving, unless its external environment was permanently friendly. For example, consider the case of a modern bureaucratic system such as a university. The university must be open, to ensure the free exchange of information (ideas). However, if its boundaries were always completely open, there would be no way to exclude harmful information such as computer viruses. Similarly, while the boundaries must be open to matter-energy inflows, they must be able to exclude harmful matter-energy, as contaminated food, raw materials of inferior quality, or human intruders.

While perpetually closed borders would threaten the survival of a social system, at least in the long run, perpetually open borders would threaten system survival also, but in different ways. While the closed system would exclude all inputs (either proper or improper), the open system would fortuitously enable needed inputs but would unfortunately allow improper inputs of matter-energy or information as well, even those that might threaten the well-being of the social system.

Entropy

There is a very fundamental difference in the internal structures of open and closed systems. According to the second law of thermodynamics, entropy will eventually tend toward a maximum in an isolated (completely closed) thermodynamic system. Entropy can be defined as a measure of disorder in a system. Thus, a system that has reached maximum entropy is in a state of complete disorder. Maximum entropy can be compared to system death. A system in a state of maximum entropy is completely lacking in structure or organization, and is basically in a random state of disarray, or maximum decay. A concrete physical system in maximum entropy has in effect expended all of its energy resources. Since it is closed, there is little hope of reversal, and it will essentially remain in a state of maximum entropy, unless its boundaries are somehow opened so that new energy (and information) can be used to renew the system (assuming that it is not beyond repair by this time).

In addition to thermodynamic entropy, statistical entropy has also been defined. Statistically, maximum entropy occurs in a set of categories, when all categories have an equal probability of occurrence. For example, if a system of individuals were distributed into four categories, each would have an equal probability of being in each of the four categories. Since maximum entropy exists, we have no ability to predict that the person is any more likely to be in one given class than any other of the possible classes. This is essentially a case of randomization.

But while it is true that the second law of thermodynamics predicts an eventual tendency toward maximum entropy in physical systems, and certainly in isolated thermodynamic systems, this is not true for social systems. Social systems routinely display an increase, over time, in organizational structure and complexity that is indicative of entropy decrease, rather than increase. How can social systems decrease in entropy when the second law says that they should increase in entropy? The answer is that by continually bringing in new energy and information from its environment, the social system can offset this internal entropy increase, and actually decrease in entropy over time.

The opposite of maximum entropy is minimum entropy, or (in some cases) zero entropy. In thermodynamics, minimum entropy is simply a state of maximum order, displaying a perpetual abundance of the required energy, so that energy shortages can never occur. Returning to the example of four categories, minimum entropy occurs statistically when all persons are in one category and none in the others. Zero entropy statistically represents complete predictability, so that the social class position of each individual can be predicted with absolute certainty (no errors). This is in direct contrast to maximum entropy, which represents a complete lack of predictive ability.

Equilibrium

In thermodynamics, maximum entropy is defined as equilibrium. This is in effect the state of complete disorder, where all energy resources have been depleted and no organizational structure remains. From the standpoint of systems theory, equilibrium is very undesirable, as it in essence represents the complete dissolution or destruction of the system. However, note a curious feature of maximum entropy: Since entropy cannot increase further, the system is ironically stable, even peaceful, even though it is technically a dead system, or a nonsystem. This connotation of stability in the term *equilibrium* greatly attracted social theorists who were looking for a way to signify stability and balance in social systems. They erroneously characterized society as being in equilibrium, not knowing that this meant maximum entropy and system death. They really did not need the equilibrium concept at all, as they were primarily interested in system stability, balance, and integration. They were not seeking a social system in equilibrium, but rather desired a system far from equilibrium, or one that was low in entropy, highly organized, and stable. This is more or less the opposite of the equilibrium concept that they were using.

After the concept of social equilibrium was strongly criticized, social equilibrium theorists searched for acceptable alternatives to equilibrium that might be less vulnerable to criticism. They turned to concepts such as moving equilibrium, homeostasis, and “steady state.” *Moving equilibrium* is the term for a series of successive equilibrium states within a given system. The theory is that even though the system may not return to its original equilibrium state, it may still achieve a new, or moving equilibrium. Homeostasis is a term denoting balance or health in an open system. The concept was originally developed for biological systems (organisms), but was applied in sociology by Talcott Parsons and others. The notion here is that the system maintains a set of interrelated variables (such as blood pressure and body temperature) within given parameters. An external change that upsets this balance in one variable (for example, body temperature) would make changes in the other variables in order to restore this balance (and thus the health) of the system. Steady state is a similar notion, referring to the static state (such as temperature) attained by a nonliving system. None of these substitutes for equilibrium satisfied the critics of the equilibrium concept, and probably never will, as the applications of equilibrium to social systems exhibit inherent fatal flaws.

Cybernetics and Sociocybernetics

Nonliving control systems such as the thermostat are termed *cybernetic systems*. The nonliving engineering system studied by cybernetics focuses on control, or “steering” of the system. The cybernetic system contains a central control mechanism (a “servomechanism”) such as a thermostat, and works through a series of interrelationships called feedback loops. A simple cybernetic system such as the room thermostat will contain at the minimum a positive and negative feedback mechanism. When the room temperature increases, the thermostat will sense this and activate the negative feedback loop so that the air conditioning turns on, which will offset or rectify the heat increase and restore the steady state temperature.

Sociologists have used principles from cybernetics to study the social system, calling this approach sociocybernetics. Sociocybernetics uses cybernetic principles such as feedback and control, often referring to the latter as *steering*. The idea is to examine ways in which the society is guided or controlled. Sociocybernetics relies rather heavily on the concept of second-order sociocybernetics. First-order sociocybernetics refers to the practice of the social system observing itself, which can be studied generically under the notion of self-reference. However, systems often have difficulty observing themselves, for a number of reasons, including problems in boundary determination. Second-order sociocybernetics is the practice of an external observer who observes the system observing itself. This often enables a clearer, and perhaps less biased, view of the actual practices of the social system.

Complexity Theory

Complexity theory is a relatively new approach that focuses on the mathematical analysis of complex systems, including the construction of computer models of modern society. Although there are different variants of complexity theory, one of the main ones is centered in the Santa Fe Institute in New Mexico. One of the chief concepts of complexity theory is the notion of the complex adaptive system (CAS). Another is the concept of entropy. CASs repeatedly adapt to their environments Over time, the living system such as the social system tends to increase in size and complexity, thus being more organized, and decreasing in entropy.

For example, as a bureaucracy grows, it will become highly complex, differentiated, and specialized, with a rigid and codified structure and a full set of written rules and regulations. Such complex social systems can take quite a toll on the environment, exhausting energy resources such as fuel and water. Since the complex social system is generally immobile, it necessarily pollutes its local environment, unless intensive care is taken and generous resources are allocated for refuse removal. Thus, as a social system becomes increasingly differentiated and grows in size and complexity, it continually adapts to its environment, modifies the environment (both positively and negatively), and readapts to this newly modified environment. This is a continuing process that proceeds in perpetuity, unless the CAS fails to meet its needs and thus falls prey to maximum entropy, a state that it generally cannot recover from.

Some systems are completely self-sufficient, satisfying all of their own needs. These are known as totipotential systems. For example, a totipotential family would grow all of its own food, plow with farm animals, and so forth, so that it need not rely on any other social system. In contrast, a partipotential living system meets some of its own requirements. It is partially self-sufficient, relying on exchanges with other social systems to provide the needed goods and services that it is unable to provide for itself.

Most large complex systems have internal subsystems. Subsystems are contained within the larger host system and often serve some function for the larger system. Internal subsystems may help the CAS adapt to its environment. A societal system that appears unitary may have an internal hierarchy composed of nested subsystem levels such as the organization, group, and individual levels.

Autopoiesis

Some systems are said to be autopoietic. An autopoietic system is a self-reproducing and self-organizing system. That is, the system reproduces the components that produce it. There is general agreement that cells are autopoietic and can reproduce themselves. However, opinion is divided about whether social systems are autopoietic. A number of scholars think that they are, while others disagree. Much of the controversy over whether social systems are autopoietic centers around the nature of the components, or basic units of the social system, as defined above. While some scholars say that the individual is the basic unit of the social system, others disagree. They claim that the basic component of the social system is not the individual, but some other social entity, such as the social role, status, the unit act, or the communication. As long as scholars disagree over the basic component (and thus the basic definition) of the social system, they will probably be unable to agree whether the social system is autopoietic or not. The debate is currently unresolved.

Equilibrium Theory

Spencer

Systems theory has a long history in sociology, beginning in the nineteenth century with the work of scholars such as Herbert Spencer and Vilfredo Pareto, who both emphasized the concept of equilibrium and both applied principles from thermodynamics. Spencer relied primarily upon the first law of thermodynamics (the conservation of energy). Spencer viewed social equilibrium as a somewhat utopian state of social harmony, balance, and integration. In an evolutionary sense, the society would not begin in equilibrium but would evolve toward this state over time. The attainment of equilibrium would be a crowning achievement for the society. Equilibrium was seen as a sustainable stable state that could be maintained once it was attained. But even before the initial publication of *First Principles*, Spencer was informed by a colleague that equilibrium in physics connoted not an idealistic state of integration and stability in a system but rather system dissolution, according to the second law. Spencer was shaken by the realization that the concept he had relied upon to signify the ultimate achievement of social integration actually implied the opposite in its original physical definition. He continued to use the concept of equilibrium, trying mightily to resolve this contradiction, but was never able to do so satisfactorily. Thus, Spencer ended his career still mired in the “Spencerian Dilemma” of how to apply the equilibrium concept in a manner that is directly opposite to its actual meaning.

Pareto

Pareto was an Italian mining engineer before turning to the study of sociology. He developed a rather elaborate equilibrium analysis. Pareto presented the notion of social equilibrium as an established fact. He chided theorists who worked without the concept of equilibrium as being mired hopelessly in a search for imaginary causes, when the use of the equilibrium concept would single-handedly provide the explanations they were seeking. Pareto's equilibrium analysis is in some ways more sophisticated and detailed than Spencer's, yet remains vulnerable to criticism. For one thing, Pareto did not entirely avoid the Spencerian Dilemma, nor did he address the issue, preferring to ignore it entirely. He also angered students of social change by postulating a rather automatic and quick return to the status quo once equilibrium was disturbed. Further, his practice of developing an analytical model, claiming it to be empirically applicable, but not providing specific empirical examples, makes Pareto highly vulnerable to charges of reification. That is, critics can say that his model is purely theoretical and that empirical application is thus illegitimate.

Parsons

While dismissive of Spencer's work, Parsons curiously fell prey to the ghost of the Spencerian Dilemma by making an inappropriate definition of equilibrium a central feature of his very definition of social order. Parsons featured the notion, apparently borrowed from Pareto, that when social equilibrium is disturbed, internal forces will work to restore order, thus apparently ensuring return to the status quo. The implication seemed to be that even if a society is threatened by a coup, it can easily thwart it and return to “equilibrium” (the status quo) through the activation of forces already operative in the society that work to maintain social equilibrium. Parsons says that societies must have a tendency to “self-maintenance” (equilibrium). He notes, though, that this equilibrium need not be “static” or “stable,” but can be “moving equilibrium.” In the final analysis, Parsons seems to have devoted more attention to defending against criticisms of his equilibrium concept than did his predecessors such as Spencer and Pareto. Parsons’ equilibrium analysis was widely criticized on a number of grounds. Probably the most vocal critics were conflict theorists, who saw the automatic return to equilibrium as an unwarranted emphasis on stability, which seems to deemphasize (or even preclude) the possibility of social change. He was also subject to the same criticisms as earlier equilibrium theorists—using the thermodynamic concept of equilibrium improperly and reifying the analytic equilibrium model by inappropriately applying it empirically.

While Parsons tried mightily to salvage the equilibrium concept, in the end, he, along with Spencer, Pareto, and other equilibrium theorists, became mired in its flaws. He attempted to avoid criticism by moving beyond thermodynamic (closed system) equilibrium to the concept of homeostasis, and moving equilibrium. The result was an eclectic congeries of equilibrium concepts in which Parsons generally retained his old equilibrium definitions while adding new ones to defend against criticism. This is a dangerous practice because, for example, it ended in his confusion of closed-system equilibrium with open-system homeostasis. By continually extending the definition of equilibrium to include nearly every type ever used by systems theorists, Parsons simply diluted the concept and lessened its rigor and specificity while failing to satisfy his critics. Ironically, all of this confusion could have been avoided by eschewing the concept of equilibrium altogether. Parsons used two related concepts of equilibrium. One featured the notions of “return to order” and “self-maintenance” and never satisfied critics. The other simply used equilibrium as a synonym for balance or stability. Parsons could have avoided a lot of criticism by simply using the term *social balance*, or even *integration*, without labeling them with the term *equilibrium*.

Functionalism

Functionalism was a reigning sociological paradigm during the mid-twentieth century, as exemplified by the work of Parsons (1951). Although not all functionalists were equilibrium theorists, functionalism did imply at least an implicit systems analysis. Basic functionalism enabled the analysis of part/whole relationships. The whole (the social system) would have certain needs, requisites, survival requirements, equilibrium requirements, or other requirements that would be generally expressed in terms of the “state” (such as a state of equilibrium or a state of integration) of the system as a whole. The whole was composed of internally related subsystems that were (either individually or in concert) fulfilling some survival function for the whole (social system, or society). If the part (such as an educational institution) did not fulfill its function adequately, then the system whole would falter at the very least, and in the worst instance, would fail to survive. Thus, in the equilibrium approach to functionalism, the function of the internal components was to ensure the maintenance of social equilibrium, thus ensuring societal survival.

Current Approaches

Bertalanffy

Social systems theory remained hobbled by the Spencerian Dilemma and the specter of the second law of thermodynamics until the publication of *General System Theory* by Ludwig von Bertalanffy. Bertalanffy's work was generally well received, and unlocked some important doors for social systems theorists. For one thing, it solved the Spencerian Dilemma by presenting evidence, based on Ilya Prigogine's Nobel Prize-winning work. Prigogine showed that while entropy in open systems such as social systems does increase internally in accordance with the second law, importation of energy can offset this entropy increase, thus allowing the society to increase in complexity. In addition to removing this barrier, Bertalanffy also employed the analysis of information, which had been generally lacking in thermodynamic discussions of systems. Still further, Bertalanffy smoothly integrated the notion of entropy into the analysis of social systems. In one fell swoop, then, he rid social systems theory of the hindrance of thermodynamic equilibrium and moved beyond this to the dual analysis of entropy and information. This was a great leap forward for social systems theory.

Miller

The most notable contribution after that of Bertalanffy was the monumental publication of James Grier Miller's *Living Systems*. Miller followed Bertalanffy in applying entropy and information in the analysis of social systems. He also presented a comprehensive format of seven hierarchical levels and 19 subsystems (later expanded to eight levels and 20 subsystems). Of the 20 subsystems, two of them (the boundary and reproducer) process both matterenergy and information. The 18 remaining subsystems process either matter-energy or information. The matterenergy processing subsystems are the ingestor, distributor, converter, producer, matter-energy storage, extruder, motor, and supporter. The information processing subsystems are the input transducer, internal transducer, channel and net, decoder, associator, memory, decider, encoder, output transducer, and timer (added later to the original list of19). These are said to be 20 “critical” subsystems, meaning that they are required for the maintenance and survival of every living system. In addition to the 20 critical subsystems, Miller presented eight hierarchical nested system levels, meaning that each higher level of system includes all the lower ones as subsystems. The original seven levels are the cell, organ, organism, group, organization, society, and supranational system. The community level was added later, in between the organization and society.

The basic notion of living systems theory (LST) is that the 20 critical subsystems always operate at each of the eight levels to maintain the system and ensure its survival. If one subsystem is missing, it potentially endangers the survival of its larger system, and thus must be replaced. There is usually a “one-level drop-back” in living systems analysis. For example, if one analyzes the society as a living system, the subsystems of interest are generally one level lower, at the organizational level. LST is an implicit variant of functional theory, although Miller himself never recognized this. LST is clearly a type of part-whole analysis (as is functionalism). Further, the term *subsystem* is somewhat of a misnomer as applied in LST. Consider the example of the decider. Deciding (decision making) is a process (function) rather than a concrete subsystem. If the group is the focus of study, the decider function is a critical function that must be fulfilled by someone one level below the group level, that is, some person. Technically, the person (organism) is the subsystem, not the decider.

Luhmann

Niklas Luhmann's contributions to GST are summarized in the monumental *Social Systems*. His contributions are numerous and complex. He is particularly famous for his presentation of society as an autopoietic system. Although a lively debate continues over whether societies are autopoietic, Luhmann firmly believes that they are. The debate centers around the proper component for the social system. Luhmann says that the proper unit or component of the social system is not the individual, act, or social role, but is instead the communication (utterance). Such communication in the form of an utterance is central to the existence of society and is indispensable. However, the utterance is not permanent. Thus, if society is built around such temporary utterances, which disappear almost instantaneously, it follows that society is autopoietic and must continually reproduce itself, by reproducing the components (utterances) that produce it.

The concept of autopoiesis has multiple advantages for Luhmann. It enables a clear analysis of social reproduction. It also facilitates a cogent analysis of social communication. Further, it serves as an excellent framework for the analysis of self-reference, including analysis of the notion of second-order sociocybernetics. Still further, it goes beyond traditional open or closed systems analysis by portraying the social system as simultaneously both open and closed. That is, Luhmann represents the autopoietic system as being organizationally closed. The internal autopoietic organizational processes by which the system ensures its reproduction are closed to the external environment (including external observers) and to other social systems. Yet, simultaneously, the system's borders remain open to exchanges of energy and information with its external environment. Furthermore, even subsystems, particularly differentiated functional subsystems such as law or medicine, can have their own exchange relationships with the external environment, perhaps independently of the relationships of the larger society. The autopoietic model allows Luhmann to transcend the old part-whole analysis of functionalism with its overemphasis on system internals.

Bailey

Kenneth D. Bailey introduced social entropy theory (SET) in the 1990s with the publication of *Social Entropy Theory* and *Sociology and the New Systems Theory*. SET moves beyond classical functionalism and equilibrium theory in a manner that complements other modern social systems approaches such as those of Bertalanffy, Miller, and Luhmann. SET focuses on the concept of social entropy. Equilibrium theorists seemed to be enamored of the equilibrium concept through a false belief that it connoted social integration and harmony. They likewise shunned the entropy concept, as they perhaps felt that it had too many negative connotations and was strictly a “physics” concept. The social application of equilibrium proved to be a dismal failure, because entropy was the more appropriate concept all along. Entropy should have been originally applied in sociology instead of equilibrium.

The concept of entropy in general, and social entropy in particular, remains controversial, as do other concepts such as social autopoiesis. Verbal theorists in sociology may resist entropy as a quantitative thermodynamics concept, while physicists may reject the notion that entropy can be applied in social theory. In reality, it has been well established in GST and SET, and is widely accepted by many social theorists, that complex social systems such as modern bureaucracies are indeed low-entropy systems, which function well far from equilibrium. In fact, low-entropy social systems such as huge modern complex bureaucracies are very low in social entropy but are some of the least fragile and most robust social systems in existence and are very difficult to destroy.

The process of building a low-entropy social system is generally the same as building a low-entropy physical system. This fact gives rise to the possibility that it was merely a historical occurrence that the concept of entropy was discovered first in thermodynamics rather than in another discipline. That is, the fact that entropy was discovered first in thermodynamics does not constitute evidence that the concept is not applicable in other fields. In reality, the processes of entropy production or entropy decrease are generic processes that necessarily exist in any system where energy and information are processed (and that includes all living systems and probably most nonliving systems). Thus, entropy is a central concept for the analysis of any system that is constructed and maintained through the expenditure of energy and information, whether these structures are physical, biological, or social.

Whether the system is a physical system (such as a huge modern building), a biological system (such as a person), or a social system (such as a huge bureaucracy), the entropy analyses are similar. In all three cases, the system, whether physical, biological, or social, can only reach a high degree of complexity, and thus a low level of entropy, through continuous expenditures of energy, which are coordinated with the appropriate information. If energy and information are available to the system and are used properly, then the system can increase in complexity and decrease in entropy, regardless of whether it is identified as a physical system, biological system, or social system. Thus, at least three types of entropy must be analyzed by general systems theorists: physical entropy, biological entropy, and social entropy.

- entropy
- sociocybernetics
- social system
- thermodynamics
- open systems
- cybernetics
- systems analysis

Kenneth D.Bailey
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See also

- Structural Functionalism
- Luhmann, Niklas
- Pareto, Vilfredo
- Parsons, Talcott
- Spencer, Herbert
- World-Systems Theory

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