

Structuralism and Medicine

Research Article

Volume 7 Issue 1- 2026

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Article History

Received: December 10, 2025 Accepted: February 09, 2026 Published: April 09, 2026

Abstract

Recent techno-scientific advances in medicine demonstrate that the functioning of the human body is determined by a clear interrelationship, interaction, and self-regulation spanning neurological, biochemical, endocrine, cardiovascular, and respiratory processes as well as by sensitive pharmacological modulation. The conception of each organ and system as part of an interrelated whole or *structure* which must be understood in its entirety rather than fragmented through synthesis and analysis, constitutes the essence of structuralism. This article attempts to address the consonance between this model and human complexity as understood from a medical perspective.

Structuralism and Selected Advances in Medicine

The structuralist movement emerged in the early 20th century across various disciplines including linguistics, literary criticism, anthropology, psychology, and systems theory partly as a reaction against positivist-oriented evolutionism. Its founder was Ferdinand de Saussure, with his seminal work *Course in General Linguistics* (1915). In this volume, he compiled material from three years of university lectures delivered at the University of Geneva, drawing upon students' interpretations of his teachings. Structuralism arose as a reaction against prevailing prior approaches, shifting the emphasis toward *synchrony* rather than *diachrony*. According to this theory, each element possesses a specific value that serves to differentiate it from all others [1].

The term *structure* designates a set of elements that are mutually interdependent—or whose constituent parts function as reciprocal extensions of one another. Each individual component is interrelated with the others as well as with the totality. Consequently, it can be said that a structure is composed of *members* rather than mere *parts*, and that it constitutes a *whole* rather than a simple *sum*. The members of this whole are so intricately interwoven that no relative independence exists; rather, they are characterized by mutual interpenetration. Indeed, the functions of every organ and system are interrelated and regulated in such a manner that they collectively contribute to homeostasis; therefore, an impairment in any single one of them inevitably affects the rest. In this way, we can understand

how the prolonged blockade of gastric hydrochloric acid secretion by Omeprazole promotes the development of gastric cancer induced by duodenogastric reflux [2]. Likewise, it sheds light on the regulation of T- and B-lymphocyte function [the immune system] through the stimulation of a norepinephrine receptor (a neurotransmitter) [3].

Regarding the characteristic of "totality," structuralists agree that the laws governing the elements of a system are not reducible to mere cumulative associations; rather, they are formed through composition, that is, they endow the whole with collective properties distinct from those of its individual elements. However, this concept of totality should not be interpreted as a frontal opposition to atomistic schemes of association, but rather as an *operative structuralism* in which what truly matters are the relationships among the elements, as well as the procedures or processes of composition [1].

The laws governing the composition of structured totalities are, by their very nature, *structuring*; and it is precisely this structuring activity that ensures the existence of a system of transformations. A system even when viewed exclusively from a synchronic perspective is not static, for it accepts or rejects innovations based on needs determined by the specific oppositions or linkages inherent to the system itself.

The third fundamental characteristic of structures is their capacity for self-regulation, which entails their self-preservation. In this sense, a structure is self-contained; however, this does not imply that the structure cannot form part as a substructure of a broader entity. The



modification of general boundaries does not result in the abolition of previously existing ones, for what occurs is not annexation, but rather confederation. The laws governing the substructure undergo no alteration but are instead preserved, such that the change constitutes an enrichment [4].

From this perspective, a detached organ lacks any real function; its function is, rather, determined by its general integration within a biological organism. Nevertheless, current medical practice remains focused on the partial and the organic, attempting to reduce the human being to discrete sectors each claimed as the exclusive domain of a specific medical specialty without integrating them into a broader structure, such as the human body, society, or culture. Specialization is indeed essential to medical practice from a technical standpoint, yet it must be grounded in a medical education that conceptualizes the human organism as an interconnected whole.

Thus, we find ourselves in an era where technoscience enables us to formulate diagnoses and gather data, however, physicians fail to contextualize, even within the broader framework of the biological structure itself. Consequently, medicine in its myopic vision has succeeded in reducing mortality and morbidity, yet we have failed to enhance the quality of life for our patients [5]. Even the very comprehension of signs and symptoms, as well as the efficacy of therapeutic interventions, is overshadowed by the side effects associated with modern pharmaceuticals [6].

In broad and fundamental terms, structuralism seeks to identify the interrelationships the "structures" through which meaning is generated within a given culture. According to this theory, meaning within a culture is produced and reproduced through a variety of practices, phenomena, and activities that serve as systems of signification (subjects of study range from such diverse matters as food preparation and serving rituals to religious rites, games, literary and non-literary texts, and forms of entertainment).

Key Authors of Structuralism: Conceptions of Structure and Principles

The initiator and most prominent representative of this movement was the anthropologist and ethnographer Claude Lévi-Strauss (1960s), who analyzed cultural phenomena such as mythology, kinship systems, and food preparation.

During the 1940s and 1950s, the French philosophical scene was characterized by existentialism primarily through the figure of Sartre though phenomenology, the return to Hegel, and the philosophy of science [with Gaston Bachelard] also made their appearance.

However, things shifted in the 1960s; as Sartre turned toward Marxism, a new intellectual trend emerged: structuralism. Lévi-Strauss initiated this new movement, drawing upon ideas from ethnology, and was subsequently followed by Lacan in the field of psychoanalysis, Louis Althusser in the study of Marxism, and, finally, Michel Foucault [4].

Lévi-Strauss views culture as a system of symbolic communication that must be investigated using methods that others have more typically applied to literature, politics, sports, or cinema; for him, the key lies in organizing simple data in the simplest possible manner. In his works influenced by Durkheim and Mauss he advocates for the application of the structural method within the human sciences. He asserts that a genuine scientific analysis must be both explanatory and simplifying, and that phonetic analyses reveal real characteristics characteristics that language users can recognize and to which they can respond; consequently, many aspects of this type of analysis are applicable to research in anthropology [7].

For Lévi-Strauss, the focus of anthropological inquiry should center on the demands of social order. Thanks to his influence, there is now

a tendency to reject ethnocentric approaches in human ethnological research in favor of studies aimed at comparing the "technologies" of people once labeled as "primitive" in contrast to the West placing value on their systems for classifying nature or diagnosing disease.

Lévi-Strauss has defined the conditions inherent in the concept of structure [7]:

a. They entail the character of a SYSTEM. This means that their elements are interrelated in such a way that a modification of any one of them implies a modification of all the others.

b. Since every model belongs to a group of TRANSFORMATIONS, each of these corresponds to a model of the same family, such that the set of these transformations constitutes a group of models.

c. The properties stated previously make it possible to PREDICT how the model will react in the event that any of its elements is modified.

d. The model must be constructed in such a way that its FUNCTIONING can account for all observed facts.

Thus, a structure is not an observable empirical reality, but rather a theoretical explanatory model constructed not as an induction, but as a hypothesis. In this way, "structure" is distinguished from "event."

Within a structure, terms are not considered in and of themselves, but rather in terms of their relationships; it is, therefore, a system of relationships and transformations, governed by an internal cohesion that is revealed through the study of its transformations. Structuralists tend to locate the explanation of facts at a level deeper than the facts themselves: at the level of "structure." Consequently, any explanation situated at a superficial level will prove irrelevant. Thus, structuralism represents a reaction against humanism, subjectivism, and historicism characteristic of the philosophies prevalent during the first half of the century.

Piaget, too, has defined structures through three characteristics [7]:

i. Wholeness (Totality): It is a system possessing properties that exceed those of its isolated elements.

ii. Transformations: It possesses a dynamic equilibrium.

iii. Self-regulation: The system is closed and self-preserving, for it is a system of self-regulating transformations.

The concept of structure or similar concepts is, of course, older than its adoption by French structuralists. It was present in mathematics through the notion of the "group," in logic as "formalization," and even in physics and biology. The equivalent in psychology can be found in the concept of *Gestalt* (form), employed by the Gestalt School, whose central objective was to move beyond the tenets of associationist theory. Lewin transposed the concept of *Gestalt* to social psychology; Freud developed a structural model of the repressed unconscious (Ego-Id-Superego); and even Marx utilized the concepts of infrastructure and superstructure to establish the premises of historical materialism [7].

Thus, Lévi-Strauss posits that social phenomena possess the character of signs and that any society can be studied as a system of signs; for instance, marriage rules and kinship systems can be regarded as a kind of language set of operations designed to ensure a specific type of communication among individuals and groups. In other words, a society can be viewed as a play of signs, language, or communication, albeit on various levels: the communication of women (the incest taboo, exogamy), the communication of goods or services, and the communication of messages. The method for studying this involves uncovering the structure or system underlying this interplay. Given that, in any case, these always constitute social phenomena that can be treated as signs, the methodology employed can be identical to that used in linguistics.



For Michel Foucault, the history of the social sciences constitutes one of the central preoccupations of his body of work a body of work that could be broadly categorized within the scope of French structuralism. He maintains that history should not be interpreted superficially; rather, it demands a more profound level of analysis. His intellectual trajectory has traditionally been divided into three distinct phases: the archaeological phase (spanning 1961 to 1969), the genealogical phase, and the final phase, characterized by the exploration of "technologies of the self." The specific method of analysis employed varies across each of these phases.

Foucault identifies late 18th- and early 19th-century Europe as the foundational moment for the emergence of a new type of society: the disciplinary society. While discipline subsequently became the most pervasive form of domination, other modes of exercising such power had existed prior to this era [8]:

a. Slavery: predicated upon a relationship defined by the appropriation of bodies.

b. Domesticity: grounded in a relationship of domination characterized as "constant, global, massive, non-analytical, unbounded, and established in accordance with the singular will the mere whim of the master."

c. Vassalage: established through a relationship of submission that was highly codified one "pertaining less to the physical operations of the body than to the products of labor and the ritualistic markers of vassalage."

Those of asceticism or of a monastic type: which are structured to ensure privation, and although they entail obedience to others, their objective is to increase everyone's mastery over their own body.

The birth of discipline of the art of the body forms a bond wherein the very mechanism renders the body all the more obedient the more useful it becomes, and vice versa. Discipline thus fabricates bodies that are subjected to and exercised "docile" bodies. Discipline increases the body's forces [in terms of utility] while simultaneously diminishing those forces [in political terms of obedience]. In a word: it dissociates power from the body; on the one hand, it transforms this power into an "aptitude" a "capacity" that it seeks to augment—while on the other, it rechannels the energy and potency that might otherwise result from it, converting them into a relationship of strict subjections. If economic exploitation separates the force of labor from its product, let us say that disciplinary coercion establishes within the body a coercive bond between an augmented aptitude and an intensified domination [8].

The disciplinary power of modern times inaugurates a silent form of punishment that operates with the aim of producing domesticated bodies. This new technology of power is driven by multiple causality. Economically, influenced by the growth of productive forces and the demographic surge of the eighteenth century presented the Old Continent with a twofold problem: the "illegalism" of bodies shifted toward material goods (criminality), and the threat of losing control over the old penal techniques of containment suddenly emerged.

The transition from the punishment of the *Ancien Régime* to that of the bourgeois order does not constitute a more punitive humanitarian system, but rather a technology aligned with new requirements a capillary justice that will penetrate into the very last crevices of the social body. What takes shape here is, undoubtedly, less a newfound respect for the humanity of the condemned... than a tendency toward a more subtle and refined justice, toward a division of the social body into narrower zones.

The process of ordering societies led to the reform and reorganization of the judicial and penal system. This process instituted a shift away from the *inquiry* a procedure aimed at ascertaining what had occurred and toward a totally different one; here, the objective is not to reconstruct an event, but rather to engage in uninterrupted and total

surveillance.

Through the metaphor of *Panopticism*, Foucault attempts to pinpoint the ensemble of mechanisms operating within all the procedural networks utilized by power. Panopticism has functioned as a technological invention in the realm of power much as the steam engine did in the realm of production. This invention possesses a particular characteristic: initially, it was deployed at local levels in schools, barracks, hospitals, and the like. Society learned how to compile case histories, establish records and classifications, and maintain a comprehensive accounting of this individual data. Thus, a *disciplinary*, *panoptic* society became established as a defining feature of modernity a society whose central objective is to mold docile bodies, bodies susceptible to modification through three specific operations [8]:

a. Continuous and personalized surveillance;

b. Mechanisms for the control of punishments and rewards; and

c. Correction, as a form of modification and transformation in accordance with predetermined norms.

Within the framework of Panopticism, surveillance plays a prominent role, given that it is exercised over individuals not at the level of *what is done*, but rather at the level of *what one is* or *what one is capable of doing*. Surveillance increasingly tends to individualize the perpetrator of an act, setting aside the juridical nature or penal classification of the act itself. In this sense, Foucault speaks of an "architecture of surveillance" one that makes it possible for a single gaze to sweep across the greatest possible number of faces, bodies, and attitudes, and to encompass the maximum number of cells. Thus, the primary task incumbent upon surveillance is "to watch over individuals *before* an infraction is committed"; for this reason, it is symbolized by an ever-open eye.

He argues that structure, in and of itself, exerts a power of domination one that is not necessarily active or reliant on the use of force, but which, in most cases, is passive and characterized by manifesting as a form of consensus among individuals (the acceptance of norms). Foucault posits that man can never be entirely free. The root of this lies in the complex web of power relations established within each particular society. His structuralism, rather than being universal, is specific to each distinct object of analysis.

Foucault deals primarily with the subject of power, thereby breaking with classical conceptions of the term. For him, power cannot be localized within a single institution or within the State; consequently, the "seizure of power" envisioned by Marxists would not be possible. Power is not regarded as something the individual cedes to the sovereign (the juridico-political contractual conception); rather, it is a relation of forces a strategic situation within a given society. Thus, since power is fundamentally a relation, it is ubiquitous; the subject is permeated by power relations and cannot be conceived independently of them. According to Foucault, power does not merely repress; it also produces "truth effects" and generates knowledge.

He identifies the emergence of a *biopower* that absorbs the ancient right of life and death once held by the sovereign and seeks to transform life itself into an object subject to administrative control by power. In this sense, regulated life must be protected, diversified, and expanded. The converse of this and, in a certain sense, its direct consequence is that, to achieve these ends, it becomes necessary to invoke death itself: whether in the form of capital punishment, political repression, eugenics, genocide, and so forth serving as a possibility exercised over life by a power whose very foundation lies in the preservation of that life. Foucault distinguishes two techniques of biopower that emerged during the 17th and 18th centuries [8]:

Anatomo-politics. It is characterized as an individualizing technology of power, based on scrutinizing individuals their behaviors and their bodies with the aim of anatomizing them; that is, of producing



docile and fragmented bodies. It is grounded in discipline as an instrument for controlling the social body, penetrating it down to its very atoms: the individuals. Surveillance, control, intensification of performance, multiplication of capabilities, spatial arrangement, utility all these categories, when applied to the concrete individual, constitute an anatomopolitical discipline.

Biopolitics. Its object is human populations groups of living beings governed by biological processes and laws. This biological entity possesses measurable rates of birth, mortality, morbidity, territorial mobility, and so forth, which can be utilized to steer it in any desired direction. Thus, from a Foucauldian perspective, power becomes materialist and less juridical, for it must now engage specifically through the aforementioned techniques with the body and with life, with the individual and with the species.

It is worth adding that the point of articulation between these two techniques lies in the control of sexuality, serving as a mechanism for the disciplinary production of the body as well as for the regulation of populations. For the author, the development of biopower and its associated techniques constitutes a veritable revolution in the history of the human species; for life itself has been thoroughly invaded and managed by power. Moreover, this development was fundamental to the expansion of capitalism, as it created the instruments for the "controlled insertion of bodies into the apparatus of production, and for the adjustment of population phenomena to economic processes" a convergence that generated an unprecedented expansion of capital accumulation. Furthermore, what is truly novel is that the biological is now reflected in the political; vital existence has thus entered fully into the modern era, for human beings subject to the power that governs them now find their very lives at stake within the political sphere. The effects of biopower caused societies to become normalizing using the law as a pretext and forms of resistance to this power entered the very battlefield that the latter had previously delimited, inasmuch as they focused precisely on the right to life and to the body, thereby displacing other objects of struggle [8].

On the plane of subjectivation, modernity availed itself of pastoral power. This concept refers to how the modern state integrated within itself an ancient form of power originally created by Christian institutions. These institutions relate to individuals and the community in a pastoral manner that is, they concern themselves with each and every individual separately (through individual relationships, such as in confession and the cycle of sacraments) throughout their entire lives, in order to ensure their salvation in the hereafter in contrast to political power, which is immanent. This power is exercised by exploring and guiding the souls and consciences of individuals, thereby producing a "truth of the self" [8].

The modern state subsumed some of these characteristics, creating a matrix of individualization that seeks to transform this salvation of the individual into a guarantee of their daily life, safeguarding it against the uncertainty inherent in the material reproduction of life [8,9]. Pastoral functions were assumed by various state officials and institutions police officers, teachers, doctors, psychiatrists, etc. as well as by the social fabric itself, particularly the family. The result is the deliberate production of a specific form of subjectivity. Society was mobilized by the state and its institutions to undertake these pastoral tasks; these tasks are, ultimately, power relations that far from competing with one another generate an efficient synergy thanks to a proper demarcation by the institutions and disciplines involved in their penetration of individuals [8].

The structuralist approach maintains that the senses are deceptive; therefore, communication must be studied through the construction of logical structures that enable the discovery of the interrelationships responsible for creating meaning, as well as the rules that constitute social norms. It further posits that if society is constituted by the existence of specific rules or structures which generate the meaning of events and provide the external norms by which to judge them then the data presenting themselves to the observer appear, on the surface,

to be interpreted in accordance with directly observable norms; yet, in reality, those norms are themselves constituted or informed by the underlying rules operative within a given society, for the very purpose of producing that specific meaning. Thus, individuals find themselves trapped within structures that serve as guidelines informing their actions in relation to the data they receive. Within the subject, the rules that generate norms applicable to each specific case have been internalized. Within this intellectual current, the contradiction between communication and information is not posited as a problem.

The contemporary subject emerges as both the voice and the product of those objective and systemic forces whether biophysical or socio-cultural within which it is embedded. We are confronted here with a form of totalization in which differences coexist and are celebrated. Anything may be true or false, good or bad, yet always within its own specific context. This rational relativism profoundly impacts the foundations of the sciences, particularly the human sciences [10].

Indeed, medicine is compelled to re-evaluate itself in light of the recognition that all knowledge is inherently unfinished and incomplete [11]. Undoubtedly, a medical education and practice that are predominantly technical and fragmented along with the current tendency of our universities to underestimate the importance and relevance of the basic sciences to provide rapid responses to societal demands hinder a biological understanding of the human being as an integrated whole [12]. It is worth noting that, without this initial step, we physicians will scarcely be able to grasp the major advances offered to us by technoscience much less will we be able to comprehend the human being as a constituent part of broader structures such as culture, society, or psychology.

From this perspective, the medical act will remain isolated from the emerging complexity of the human condition, failing to understand the reality confronting it, and merely treating specific symptoms without improving the patient's quality of life.

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