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Featured Article

French Theory and Cybernetics

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Abstract: This essay aims to reassess the historical significance of structuralism and contextualize its relevance within the emergence of French theory during the 1960s. The genesis of this French theory cannot solely be attributed to the continuum of French philosophical history; rather, it stems from an external catalyst that illuminated a latent theoretical blind spot. I posit that these external influences emanate from the realms of cybernetics and information theory. From this perspective, the essay explores Lévi-Strauss's engagement with cybernetics theory and its intersection with his structuralist framework. His theory of structure emerges from a discerning analysis of Shannon's and Weaver's communication theory, which accentuates the significance of redundancy—a fact that information theory tends to disregard as inconsequential. Upon this presupposition, the essay reconceptualizes the interrelation between structuralism and poststructuralism or postmodernism through the discussion of cybernetics and information theory.

Keywords: French theory, cybernetics, information theory, postmodernism

Why is it necessary to revisit postmodernism and its relation to the rise of 'French theory,' which today sounds outdated, and can this twentieth-century term provide insights into the twenty-first century? The many misconceptions and prejudices arising from its overuse need to be addressed with an understanding of the historical conditions that created what is called postmodernism. In this essay, I will argue that postmodernism, as an intellectual and cultural movement rather than a specific concept, needs to be rethought as a symptom of the contradictions and limitations of the European Enlightenment.

Whether one defines postmodernism as the cultural logic of late capitalism, as a reiteration of modernism, or as a new epistemology that inevitably emerges under the conditions of the end of modernity, I believe that postmodernism can be defined as a reflection on European modernity that experienced the catastrophe of two world wars and the subsequent emergence of the US-led world system. The material foundations of this

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European modernity were the nation-states and imperialism, and these fundamental problems are still the legacy that defines the world today. From this perspective, postmodernism is not something to be sealed away in a museum as a relic of a bygone era, but rather a problem of the past that persists in the present and needs to be revisited as a condition that defines us today.

Interestingly, the French philosophy of the 1960s, which is often cited as the origin of the excesses of postmodernism, does not actually use the term. While Jean-François Lyotard and Jean Baudrillard draw direct parallels to postmodernism, their interpretations differ significantly from the widely accepted contemporary understanding of the concept. Behind this is a theory of anthropology stemming from Claude Lévi-Strauss, called structuralism. Of course, it is 'textbook common sense' to accept poststructuralism, which emerged as a critique of structuralism, as another name for postmodernism. However, poststructuralism, also translated as deconstruction and many notions, is only a convenient term, and the designation is not found in France, the birthplace of this intellectual movement.

In other words, whether poststructuralism or postmodernism, these terms were coined from outside the movement, not from within it. An alternative term would be French theory, which refers to a new current of thought or intellectual movement that emerged in the 1960s and reached its peak after the French May Revolution of 1968. This chronological development coincides with the French left's desire to revolutionize Marxism to address the problems of the French Communist Party (PCF), which were triggered by the Algerian War and the disillusionment of Stalinism, made self-evident by May 1968. In the process, Lévi-Strauss's structuralism is positively received, and this curious interest ends with a critique of structuralism.

The term postmodernism would characterize this series of debates rather than the term Marxist innovation or post-Marxism. In other words, the intellectual and cultural fad categorized as postmodernism is the commodification of knowledge as French philosophy's theoretical response to Marxism encounters the era of global cognitive capitalism. As such, this process is far from unique. It is a pattern that has been repeated endlessly since imperialism when the "rest" of the world found themselves in the position of catching up with European modernity. At this point, the question of postmodernism, which is only faintly connected to the post-war French Marxist movements, is revitalized through the historical context of the Cold War and its aftermath.

As recent research has shown, postmodernism was not unconnected to structuralism and the Marshall Plan, and by extension, to the U.S. foreign policy for reorganizing capitalism through pragmatism and technocracy. The

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financial support to realize the Marshall Plan came from the Rockefeller Foundation, and Lévi-Strauss's structuralism was a beneficiary of this funding.

Another reason for Lévi-Strauss's access to U.S. funding was his interaction with Roman Jakobson, whom he had met at the wartime Free University in New York City, where he had kept abreast of cybernetics and information theory, both of which were on the minds of American academics at the time. A recently published correspondence tells the story of this process. The origins of structuralism, as intertwined with cybernetics and information theory, are essential to understanding and contextualizing why a critique of structuralism emerged. To some point, certain French Marxists, the pioneers of today's French theory, embraced structuralism as a transformative extension of Marxism. Therefore, the challenge of French theory in the 1960s is still relevant today, when technological discourse based on cybernetics and information theory, including artificial intelligence, has become mainstream. To move beyond the current impasse of the return of the old to the new, we need to solve the tasks left by postmodernism again.

Why French 'Theory'?

The naming of French philosophy as a 'theory' since the 1960s follows a tendency to recognize postmodernity as a concrete condition of reality. The most prominent theorist of this trend is Fredric Jameson, who wrote in a 2004 article that he believes "theory has replaced philosophy from the moment we realize that thought is linguistic and material and that concepts cannot exist independently of linguistic representation".[1] From this perspective, Jameson is critical of positions such as Alain Badiou's that advocate a "reinstatement of philosophy." For him, the end of philosophy is tied to the legitimacy of Marxism.

According to Jameson, three historical moments were marking the end of philosophy, or more precisely, European metaphysics, and the rise of theory. The first two moments were the rise of structuralism and the emergence of poststructuralism, and the third was the emergence of poststructuralism as "the most regressive academic discipline and the most tedious and tiresome form of philosophizing",[2] in which questions of politics are discussed primarily through rereading classical texts. Jameson's point is aimed at the "reification" of theories that have become mired in the swamp of liberalism. Interestingly, in opposition to this retro, hagiographical third

[1] Fredric Jameson, "Symptoms of Theory or Symptoms for Theory?," in *Critical Inquiry*, 30:2 (Winter 2004), 403.

[2] *Ibid*., 405.

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wave, Jameson foresees a fourth wave of theory, "the theorization of collective subjectivity",[3] in keeping with his Marxist understanding that economics has replaced politics.

As Jameson's discussion shows, it is hard to deny that there is a tension between the names' French theory' and 'French philosophy,' which we often use interchangeably. There are various interpretations of this tension, including François Cousset's cynical view of the terminology itself as an 'American cultural product.' In *French Theory*, Cousset sees the prevalence of French theory as a product of American academia, where "Lacanian - Derridean and Foucauldian-Deleuzean perspectives gradually began to occupy the intellectual field in many countries" because of the importation of French philosophy into the United States.[4] Ironically, Cousset believes that in France, the country of origin of French theory, the theoretical discussion of philosophers of interest in the United States has disappeared. According to him, the "theorists" who represented French theory in the public sphere "gradually shrank into obituaries and intellectual nostalgia, and their legacy became the monopoly of a few isolated heirs and the official rights holders of their publications".[5]

It seems that his views have not changed much in recent years. In a 2022 article for an online media outlet, Cousset compares French theory to K-POP and reaffirms that "French theory is American." By the word "American," he means the political synecdoche in which a country represents the entire continent of the different countries or even the entire Northern Hemisphere. To summarize, Cousset's diagnosis is that French theory is a product of America and that this American proper noun, like K-POP, has lost its uniqueness and is functioning as a global, common noun. While this is a compelling point on a phenomenological level, Cousset's argument is highly problematic for the debate surrounding the acceptance of French theory.

As Cousset himself acknowledges, his diagnosis is partisan in that it relies on empirical impressions rather than concrete evidence or facts. In his analysis of the globalization of French theory, he overlooks the nuanced receptions of Derrida in India, Deleuze and Guattari in Japan, and Foucault in Brazil. Crucially problematic in Cousset's argument is the omission of the fact that not all French philosophy has been appropriated as French theory. The fact that specific philosophical trends or movements of thought, the so-called "68 ideas," have been categorized as French theory is a seemingly trivial but important point to examine. This included the iconic "global

[3] *Ibid*., 406.

[4] François Cousset, *French Theory: How Foucault, Derrida, Deleuze, & Co. Transformed the Intellectual Life of the United States*, trans. by Jeff Fort with Josephine Berganza and Marlon Jones (Minneapolis: University of Minnesota Press, 2008), 309.

[5] *Ibid*.

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intellectuals" of Sartre and Beauvoir, who emerged from outside of French institutional philosophy. They refused to call themselves "philosophers," and this anti-philosophical tendency was one of the important elements of French theory.

As Cousset also points out, the French intellectual current of the 1960s, so-called poststructuralism or postmodernism, was concerned with innovations in Marxism.[6] Cousset defines this as a distancing from classical Marxism, but historically speaking, the flourishing of French theory is closely linked to anti-Stalinism, the Cold War, and the subsequent détente phase. The "campus Marxists" that Cousset describes in his book—the "Marxist teachers" who dominated post-war French universities, reducing French theory to aesthetics, rhetoric, or, at best, the analysis of cultural symbols—were the mouthpieces of "official Marxism" represented by the PCF. In this context, the emergence of French theory is not unrelated to the post-war situation in France and the international context, which saw the rise of the Third World movement after the Algerian War. In conclusion, Cousset's discussion suffers from the problem of simplifying the complex political terrain surrounding this French theory.

A perspective that diverges from Cousset's discussion is that of studies that locate the development of French philosophy in the 1960s in France's own philosophical genealogy. Vincent Descombes's *Modern French Philosophy* and Gary Gutting's *French Philosophy in the Twentieth Century* are two examples. Interestingly, Descombes's book has a different title in the English translation than in the original French. The original title was *Le Même et l'autre Quarante-cinq ans de philosophie française 1933–1978* (The Same and the Other: 45 Years of French Philosophy 1933–1978), and the two subjects, which abbreviate the history of 45 years of French philosophy, had to be replaced by the generic phrase "contemporary French philosophy" for a transatlantic audience. While this decontextualization was a condition of French theory, it should not be overlooked that within the current French philosophy, there were attempts to deconstruct the so-called philosophical tradition and challenge dogmatic knowledge.

Gilles Deleuze, who can be seen as representative of the philosophy of this period, quoted Marcel Proust, and defined theory as "a box of tools," a much more philosophy-friendly position than Michel Foucault, who was skeptical of philosophy itself. Nevertheless, Deleuze's statement can be largely seen as a departure from the traditional scope of philosophy as we know it.[7] Deleuze follows in the footsteps of Althusser, who, like Badiou,

[6] *Ibid*., xv.

[7] Michel Foucault, *Language, Counter-Memory, Practice: Selected Essays and Interviews*, trans. by Donald F. Bouchard and Sherry Simon (Ithaca: Cornell University Press, 1977), 208.

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advocated for a distinct realm of philosophy that was both the same and different from that of philosophy and who sought to establish Marxist philosophy as a "general theory." In this context, Deleuze's language was intended to emphasize the practicality of theory. It resulted from his attempt to move beyond the humanistic Marxist or Western Marxist conception of theory and practice of the 1960s.

In *Modern French Philosophy*, Descombes provides a relatively faithful account of the problematization of postwar French philosophy, beginning with Alexandre Kojève's interpretation of Hegel and moving towards a deconstruction of the progressivist view of history. In this way, Descombes points out the interplay between the line struggle within the PCF and the formation of French philosophy in the 1960s. His pointing out the close connection between the formation of post-war French philosophy and the problems of decolonization or national liberation movements, including the Algerian War, helps us to understand the political motivations inherent in 'French theory.' Along the same lines as Descombes's concerns, Johannes Angermuller's book *Why There Is No Poststructuralism in France* provides a historical overview of the genealogy of French philosophy in the 1960s.

Angermuller divides the formation of the French theory into three stages, starting with an academic conference held at Johns Hopkins University in the United States in October 1966.[8] Angermuller details the ways in which structuralism intervened in the tradition of French philosophy, with a particular emphasis on the confrontation between Sartre and Lévi-Strauss. Similar genealogies can be found in Alan Schrift's *Twentieth-Century French Philosophy* and Henry Somers-Hall's *Judgement and Sense in Modern French Philosophy*.

Whereas Descombes's book starts with Hegel, Schrift starts with Bergson and Nietzsche, and Sommers-Hall starts with Kant to show the transformation of French philosophy in the 1960s. It is noteworthy that Sommers-Hall's recent book does not cover the topic of structuralism, a central theme in the other books. In the chapter on Derrida, the book does not use the term structuralism at all, except to briefly characterize Derrida's discussion as "poststructuralism" and move on. This symptomatic remark may emphasize the uniqueness of "French philosophy" as distinct from "French theory." Sommers-Hall's method of description, which leans towards a traditional view of the history of European philosophy, is in this sense quite regressive compared to Descombes's and Angemuller's, and paradoxically, it is possible to read in it the liberal arts materialization of French philosophy that Jameson points to.

[8] Johannes Angermuller, *Why There Is No Poststructuralism in France: The Making of an Intellectual Generation* (London: Bloomsbury, 2015), 16.

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On the other hand, it is worth noting that, as recent studies have shown, other currents at the origin of French theory 'invaded' the French philosophical tradition from outside rather than within it. The emergence of this 'particular' theory, so to speak, was not limited to the internal traditions and circumstances of French philosophy but was made possible by a shock from outside philosophy: the strangers were cybernetics and information theory. Bernard Dionysius Geoghegan's *Code: From Information Theory to French Theory* is a notable intellectual history of this shock. In this book, Geoghegan points out that the foundations for theorizing society in today's digital language were laid through three enclosures, or "laboratories": colonies, sanatoriums, and camps.[9] Applying the data obtained from these so-called sample experiments to general social analyses was of interest in France after the Second World War. In this way, the concept of "code," based on cybernetics and information theory, along with structuralism, played an essential role in the post-war reconstruction of French philosophy. Geoghegan describes this process as follows.

> Structurally minded thinkers, among them anthropologist Claude Lévi-Strauss; literary critics Roland Barthes and Julia Kristeva; psychoanalysts Lacan, Luce Irigaray, and Félix Guattari; and philosophers Jacques Derrida, Michel Serres, and Michel Foucault, applied the emerging intellectual tools to paradoxical ends. They wielded the new emphasis on theory and codes against the dogmas of humanism, and used it to valorize the kinds of analytical and textual operations long practiced in fields like criticism, psychoanalysis, and ethnography. As for the imperial thrust of - these emerging knowledge practices, and their association with U.S. hegemony, that too they put to a new purpose. In a country that identified modernization with imperial expansion, they flirted with visions of France as a new space of techno-rationalization, the human sciences practicing the kind of rational inventories nineteenth-century imperial ethnographers carried out in the colonies.[10]

[9] Bernard Dionysius Geoghegan, *Code: From Information Theory to French Theory* (Durham, NC: Duke University Press, 2023), 1.

[10] *Ibid*., 134.

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The three types of laboratories mentioned by Geoghegan are not unrelated to the "colonial science" that developed alongside the development of imperialism. Along the same lines, George Steinmetz points out that "one of the distinctive features of colonial science, including social science, in contrast to traditional science, was its close connections to applied policymaking".[11] In other words, French sociology and other academic disciplines were developed as a way to make colonial management more efficient, and "many colonial scientists moved back and forth between the roles of basic scientist, Cameralistic counselor, and government administrator".[12] The relationship of French theory to these imperial laboratories and postwar academic systems needs to be examined in an intellectual-historical context. First and foremost, the fact that French theory is a "theory" has important implications. As Jameson emphasizes, we cannot ignore the context in which the decisive break between French philosophy and French theory occurred.

Structuralism and Cybernetics

This fundamental break in what we might call the 'turn of theory' occurred with Lévi-Strauss's structuralism. The history of French theory, or critical theory, is the history of structuralism. Structuralism was embraced as "a formalistic and objective way of thinking about the surface appearances that lie beneath conceptual patterns".[13] The context for its adoption was the post-war U.S.-led geopolitics to rebuild capitalism, including the Marshall Plan. Ronald R. Kline identifies cybernetics and information theory as key theories in this Cold War plan for a new world order. This was, above all, the era of "Cold War science" and the global generalization of the concept of cybernetics, which had been introduced in wartime as a theory for air defense systems. Kline points out that "viewing cybernetics as a Cold War science was strong" and emphasizes that "the height of its media coverage, from late 1948 to early 1951, occurred during the fervor of the early Cold War".[14] The CIA and the Rockefeller Foundation played a significant role in the rise of cybernetics and information theory in postwar America.

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[11] George Steinmetz, *The Colonial Origins of Modern Social Thought: French Sociology and the Overseas Empire* (Princeton: Princeton University Press, 2023), 57.

[12] *Ibid*.

[13] Jacob Collins, *The Anthropological Turn: French Political Thought After 1968*, (Philadelphia: University of Pennsylvania Press, 2020), 11.

[14] Ronald Kline, *The Cybernetics Moment, or Why We Call Our Age the Information Age* (Baltimore: Johns Hopkins University Press, 2015), 83.

https://doi.org/10.25138/18.4.fa
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Although the Rockefeller Foundation was a private funding organization, it was an essential supporter of the Cold War system.[15] In 1950, amid the Cold War rhetoric of anti-communism and McCarthyism, John Marshall, the Rockefeller Foundation's director of support for the humanities, was the architect of the foundation's postwar support policies. Marshall's rationale, grounded in liberal internationalism, was "the welfare of mankind," but this abstract cause was all too well aligned with the national interests of the United States, which was then entering into a systemic rivalry with the Soviet Union.[16] It was in this rapidly reshaping postwar context that French intellectuals and scholars encountered cybernetics and information theory. Interestingly, this encounter was clearly accidental, but it was also foreseen. This accidental yet inevitable meeting takes place during the visit of the American mathematician Norbert Wiener to Paris in 1947. While in Paris to give a special lecture, Wiener met Enrique Freymann of the Hermann publishing house, who invited him to write and publish his lecture as a book.

While Wiener's role was undoubtedly significant, and there was post-war American financial support, it is difficult to see the relationship between French theory and cybernetics as a matter of one-sided reception. Interestingly, given that the first French translation of Cybernetics was published in 2014, it is unlikely that the cybernetics and information theories proposed by Wiener, which overhauled the post-war Anglo-American academic system, were accepted at face value by the established French academic community and facilitated the dissemination of the new theories. Rather, these contacts triggered a wide range of acceptance at the popular rather than academic level. A typical example was Dominique Dubarle's 1948 review in *Le Monde*.[17] Dubarle's introduction of the term "cybernetics" was not a new neologism for French readers. The nineteenth-century physicist André-Marie Ampère had already discussed cybernetics as the science of government.[18]

In the context of this acceptance, a French interpretation of the concept of cybernetics itself was added. The understanding of the term in the French context was more centered on the issue of "automation" and its limitations than the Anglo-American terminology of cybernetics, which was more orientated towards the monolithic explanations of "control" and "feedback." A vital issue in this discussion of automation was the claim that the precision of machine behavior is always subject to the interference of the

[15] Tim B. Mueller, "The Rockefeller Foundation, the Social Sciences, and the Humanities in the Cold War," in *Journal of Cold War Studies*, 15:3 (Summer 2013), 108.

[16] *Ibid*., 109.

[17] Christopher Johnson, "French Cybernetics," in *French Studies*, 69:1 (2014), 62.

[18] *Ibid*., 64.

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"game" (*jeu*), and therefore, the process of control is limited.[19] At this point, it is not difficult to see a theme running through the development of postwar French theory that transcends the distinction between structuralism and poststructuralism. In *The Freudian Robot: Digital Media and the Future of the Unconscious*, Lydia H. Liu writes that "what we now call French theory was already a translation of American theory before it landed in America to be reinvented as French Theory" and gives the example of how the different concepts of "game" and "play" became literary and critical terms under French influence.[20]

Although an oversimplification, Liu's argument reveals that the particular movement of thought we vaguely refer to as 'French theory' or 'post-war French philosophy' was not a unique situation in France. In other words, the so-called French theory was not even French in the traditional sense but rather a product of internationalism or transnationalism, which sought to deconstruct what was French and create a new theory. It is worth recalling that post-war French philosophy may have turned to cybernetics and information theory as an alternative to overcome the "ontotheology" of European metaphysics that Heidegger's critique of Hegel had proposed. As this topic deserves a separate discussion, I will focus only on the process of 'convergence' of cybernetics and French theory.

The common interest in cybernetics led to the term becoming a kind of silver bullet in postwar France.[21] The anthropologist Lévi-Strauss linked this widespread interest in cybernetics and its academic acceptance as a theory to explain society scientifically. In post-war America, cybernetics and information theory played a decisive role in establishing itself as a new social theory, with significant financial support from the Rockefeller Foundation, the Ford Foundation, the Wenner-Gren Foundation, and the Josiah Messer Jr. Foundation. In this process, cybernetics and information theory were the source of sociological concepts such as encoding, decoding, information, feedback, entropy, and systems that are familiar to us today. In post-war America and France, cybernetics was interpreted by sociologists as a 'general theory' that could explain human behavior and social mechanisms, and the adoption of mathematical modeling as a methodology to capture these multiple layers of reality was a hallmark of the 'human behavior studies' that marked a significant turning point in post-war sociology. The study of human behavior, intensively supported by the Ford Foundation, fundamentally changed the foundations of modern disciplines such as

[19] Albert Ducrocq, *Découverte de la cybernétique* (Paris: Juillard, 1955), 38–39.

[20] Lydia H. Liu, *The Freudian Robot: Digital Media and the Future of the Unconscious*, (Chicago: The University of Chicago Press, 2010), 153.

[21] Bernard Dionysius Geoghegan, "Textocracy, or the Cybernetic Logic of French Theory," in *History of the Human Science*, 33:1 (2020), 56.

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sociology, anthropology, psychology, economics, and political science.[22] The notion of communication raised by cybernetics as a concept for explaining the relationship between individuals and groups was embraced as a revolutionary idea.

Similarly, Lévi-Strauss's structuralism was a theory that used cybernetics in the United States and other contexts to explain the transformation of complex and dynamic communities in terms of structure. The intersection of Lévi-Strauss and cybernetics was made possible through Roman Jakobson. As will be discussed in more detail later, Jakobson, a Russian exile, met Lévi-Strauss while working at *L'école libre des hautes études de New York*, the French government-in-exile educational institution established in New York during the war. Jakobson attended a conference of cybernetics researchers organized by Wiener under the auspices of the Macy Foundation and attempted to apply this mathematical theory to linguistics. One could argue that Jakobson's interest naturally led him to Lévi-Strauss's structuralism. However, Klein and Geoghegan add to this by pointing out that the origins of structuralism lie in the American idea of reorganizing the post-war world through pragmatism and technocratic bureaucracy. Behind this idea was the successful development of physics during the Second World War, which led to efforts to do the same in biology, economics, and psychology. Applying the methods of physics to other disciplines meant a greater emphasis on quantitative research methods and the introduction of mathematical theories of information.[23]

Interestingly, Wiener opposed treating cybernetics as a general theory and applying it to other studies because data collection in sociology is not based on closed circuits like cybernetics and lacks the observer's role. Of course, regardless of his wishes, the situation developed in the opposite direction. Despite his opposition to the application of cybernetics to social research, Wiener believed that even if the communication of social systems is more complex than that of machines, the grammar of the two is the same.[24] This sameness, or the totality of cybernetics, was the basis for Lévi-Strauss's formulation of structuralism. As Jean-Pierre Dupuy points out, what Lévi-Strauss's structuralism sought was "perception without a subject," "perception itself without a mind," and cybernetics was precisely the theory that served this purpose.[25] For Wiener, human psychology operates beyond the limits of logic and must ultimately be reduced to the central nervous system of cybernetics. For Lévi-Strauss, this mechanism of reduction was

[22] Kline, *The Cybernetics Moment*, 136.

[23] *Ibid*., 133.

[24] *Ibid*., 144.

[25] Jean-Pierre Dupuy, *On the Origins of Cognitive Science: The Mechanisation of the Mind*, trans. by M. B. DeBeviose (Cambridge, MA: The MIT Press, 2009), 19.

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how psychology could be recognized. Lévi-Strauss defines "the structural studies are, in the social sciences, the indirect outcome of modern developments in mathematics which have given increasing importance to the qualitative point of view in contradistinction to the quantitative point of view of traditional mathematics",[26] and he points to cybernetics and information theory as examples of the success of this modern mathematics. Clearly, this diagnosis represents a different perspective from Wiener's skepticism about the applications of cybernetics and the assessment of cybernetics that was underway in the United States.

Lévi-Strauss was not unaware of these criticisms of the application of cybernetics to the social sciences; rather, he sought to combine anthropology and cybernetics to create an integrated science that would go beyond the limits of empirical science. Lévi-Strauss believed that the difficulties of anthropology in escaping empiricism could be solved by building language models. For this solution, perhaps even more influential on Lévi-Strauss's conception of structure than Wiener was Claude Shannon and Warren Weaver's *The Mathematical Theory of Communication*, which defined communication as writing, speech, music, painting, theatre, ballet, and any process that moves the emotions of others. In the book, they argue:

> The word *communication* will be used here in a very broad sense to include all of the procedures by which one mind may affect another. This, of course, involves not only written and oral speech, but also music, the pictorial arts, the theatre, the ballet, and in fact all human behavior. In some connections it may be desirable to use a still broader definition of communication, namely, one which would include the procedures by means of which one mechanism (say automatic equipment to track an airplane and to compute its probable future positions) affects another mechanism (say a guided missile chasing this airplane). The language of this memorandum will often appear to refer to the special, but still very broad and important, field of the communication of speech; but practically everything said applies equally well to music of any sort, and to still or moving pictures, as in television.[27]

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[26] Claude Lévi-Strauss, *Structural Anthropology*, trans. by Claire Jakobson and Brooke Grundfest Schoepf (New York: Basic Books, 1963), 283.

[27] Claude E. Shannon, and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1963), 3.

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The definition that all cultural forms are communication was the decisive clue for Lévi-Strauss to establish language as the scientific foundation of cultural anthropology. While ethnography and social studies may not fulfill Weaver's demand for scientific measurement, Jakobson's linguistics serves as the conditions of a scientific object of study.[28] Through this dialectical syllogism, Lévi-Strauss reconstructs anthropology through linguistics and thus establishes structuralism. By examining the background of structuralism, which is closely linked to cybernetics, we can better understand the context of the structuralist-poststructuralist debate in French theory.

Qualitative Mathematical Models

As mentioned earlier, the decisive moment in the birth of French theory was Lévi-Strauss's meeting with Jakobson in 1940. This meeting was not simply a meeting between an anthropologist and a linguist. Rather, it was a meeting that completely changed the landscape of thought in the post-World War II Cold War era. This shift was in line with U.S. post-war strategies, such as the Marshall Plan, which sought to expand pragmatism and technocracy against communism. It is significant here that the 'international fraternity' of scientists who assisted the Allies in their operations during World War II played a leading role.[29] Lévi-Strauss's and Jakobson's interest in cybernetics and information theory was fuelled by financial support from the Rockefeller Foundation. The Rockefeller Foundation supported anthropology and linguistics as a means of spreading scientific innovation on a global scale. Scientific innovation, as they envisioned it, was the rational elimination of partisan political forces that rejected objective, scientific analysis through expert-driven policymaking based on unbiased tools and methods. One of the many ways in which this "Great American Mission" was to be realized was the Marshall Plan, whose main objective was to defend Europe against Soviet influence.

In this context, Lévi-Strauss was somewhat of a paradox. When the Rockefeller Foundation chose to support him, U.S. intelligence identified him as a communist considering his work in South America, but the "structuralist anthropology" that Lévi-Strauss developed under the auspices of the Rockefeller Foundation laid the foundations for the French theory that Stalin

[28] Christopher Johnson, *Claude Lévi-Strauss: The Formative Years* (Cambridge: Cambridge University Press, 2003), 98.

[29] Bernard Dionysius Geoghegan, "From Information Theory to French Theory: Jakobson, Lévi-Strauss, and the Cybernetic Apparatus," in *Critical Inquiry*, 38:1 (Autumn 2011), 102.

https://doi.org/10.25138/18.4.fa
https://www.kritike.org/journal/special_issue_2025b/lee_february2025.pdf
ISSN 1908-7330

later regarded as an internal danger. Interestingly, in his correspondence with Jakobson, Lévi-Strauss reveals that he was greatly inspired by Shannon's and Weaver's *The Mathematical Theory of Communication*. Lévi-Strauss writes that he "literally devoured the book" and emphasizes that it was their theorization of thought from a "machine point of view" or "object point of view" that was of most significant interest to him. Realizing that Shannon's and Weaver's mathematical theory allowed for a de-humanistic epistemological shift, he writes that he was "inspired to apply this methodology to mythical systems of thought".[30]

Lévi-Strauss saw in cybernetics and information theory, or more precisely, in mathematical models that promote algorithms of chance, the possibility of theorizing myths that cannot be understood in ordinary language. This idea was not so different from Wiener's. Wiener wanted to establish cybernetics as a general theory that could communicate between different scientific languages. The field of general theory is described by Wiener as "the most fruitful areas for the growth of the sciences were those which had been neglected as a no-man's land between the various established fields".[31] However, this inspiration did not mean that Lévi-Strauss's structuralism was a straightforward application of Shannon's and Weaver's mathematical model to the study of mythology. He challenged Shannon's and Weaver's notions of information and redundancy, arguing that the communication system of symbols works in the opposite way to their description. Shannon considers messages that can be calculated in terms of the amount of entropy as information, which is why unpredictable messages, or noise, are seen as containing more information. Weaver adds to Shannon's theory from the perspectives of discourse theory and semantics, defining that the redundancy of information transmission in different contexts, the repeated act of correcting an erroneous message, has an emotional impact on the receiver of the message and conveys meaning. They argue that a certain amount of redundancy can be treated as non-existent, provided that it does not exceed the efficiency of meaning conveyance.

> One minus the relative entropy is called the *redundancy.* This is the fraction of the structure of the message which is determined not by the free choice of the sender, but rather by the accepted statistical rules governing the use of the symbols in question. It is sensibly called

[30] Roman Jakobson and Claude Lévi-Strauss, *Correspondance 1942-1982*, (Paris: Seuil, 2018), 129.

[31] Norbert Wiener, *Cybernetics or Control and Communication in the Animal and the Machine* (Cambridge, MA: The MIT Press, 1965), 4.

https://doi.org/10.25138/18.4.fa
https://www.kritike.org/journal/special_issue_2025b/lee_february2025.pdf
ISSN 1908-7330

> redundancy, for this fraction of the message is in fact redundant in something close to the ordinary sense; that is to say, this fraction of the message is unnecessary (and hence repetitive or redundant) in the sense that if it were missing the message would still be essentially complete, or at least could be completed.[32]

The upshot is that redundancy is not important to the message in the sense that the presence of redundancy does not hurt communication. Interestingly, Shannon and Weaver cite linguistic statistics to prove their hypothesis. They say that "the redundancy of English is just about 50 percent, so that about half of the letters or words we choose in writing or speaking are under our free choice, and about half (although we are not ordinarily aware of it) are really controlled by the statistical structure of the language".[33] Lévi-Strauss disagrees with this idea and believes that the very point of redundancy or repetition is important in communication.

Lévi-Strauss's thinking is well illustrated in "Human Mathematics." In this article, first published in the UNESCO Newsletter, Lévi-Strauss emphasizes "human mathematics" as the counterpart of "qualitative mathematics" to Shannon's and Weaver's mathematical model. His argument is that while Shannon's and Weaver's mathematical model can serve an important function as a general theory that unites various disciplinary differences, it cannot capture social dynamics such as macroeconomics or population. Manipulation and simplification are inevitably involved in the quantitative reduction of qualitative issues, making it difficult to reproduce class relations that are composed of discrete values.

> This mathematics of man—to be discovered along lines that neither mathematicians nor sociologists have as yet been able to determine exactly, and which is, no doubt, still to be elaborated a very large extent—will, in any event, be very different from the mathematics which the social sciences once sought to use in order to express their observations in precise terms. It is resolutely determined to break away from the hopelessness of the "great numbers"—the raft to which the social sciences, lost in an ocean of figures, have been helplessly clinging; its ultimate object is no longer to plot progressive and continuous movements in monotonous graphs. The

[32] Shannon and Weaver, *The Mathematical Theory of Communication*, 13.
[33] *Ibid*.

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> field with which it is concerned is not that of the infinitesimal variations revealed by the analysis of vast accumulations of data. The pictures it gives is, rather, that resulting from the study of small numbers and of the great changes brought about by the transition from one number to another.[34]

In this way, Lévi-Strauss sought to define structuralism by defining qualitative mathematics as distinct from quantitative mathematics. In short, structuralism was a theory that sought to explain society through qualitative mathematical models, using language as a scientific foundation. Of course, as we have seen, Jakobson had a decisive influence on the formation of Lévi-Strauss's structuralism. The Russian linguist, funded by the Rockefeller Foundation, introduced the enthusiastic young anthropologist to cybernetics and information theory. In 1949, at the end of World War II, Jakobson embraced elements of cybernetics and information theory and succeeded in securing funding for his research from the Rockefeller Foundation. For Jakobson, cybernetics and information theory were the future of human science. In 1948, Jakobson could attend the Macy Conference on cybernetics as a guest. Jakobson's participation in the conference was prompted by a call from founding members Gregory Bateson and Margaret Mead that sociologists should be actively invited to address the disconnect between the natural sciences and the social sciences.

After attending the conference, Jakobson asked Weaver of the Rockefeller Foundation to send books on cybernetics and information theory to Lévi-Strauss and Jacques Lacan in Paris. Jakobson's help made possible Lacan's writings and seminars on cybernetics. Lévi-Strauss interpreted Marcel Mauss's theory to conceptualize primitive gift-giving and receiving practices as corresponding to cybernetic communication systems. This interpretation is the product of a perspective that integrates linguistic, economic, social, and technological systems of communication. The adoption of this perspective explains why there is no essential distinction between technical and linguistic communication in the discussions of French theorists such as Barthes, Baudrillard, Derrida, Deleuze, and Guattari.

Lévi-Strauss's structuralism is, therefore, not a relic of a bygone era that poststructuralism or postmodernism has overcome. On the contrary, the challenges posed by structuralism are still with us. Structuralism sought to uncover the underlying principles of how symbolic systems work by examining how they are organized and interconnected. This effort involved

[34] Claude Lévi-Strauss, "Human Mathematics," in *The UNESCO Courier*, 5 (2008), 22–23.

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ISSN 1908-7330

classifying the elements of a system, understanding their relationships, and identifying patterns as the initial steps to understanding. Poststructuralism paradoxically uses structuralist methods to deconstruct the implicit logic that constitutes structuralism. Whether or not poststructuralism is a fundamental break with structuralism is a matter of debate, but what is clear is that without structuralism, there would be no poststructuralism. Poststructuralism was a theoretical trend that sought to rethink cybernetics and information theory, especially the problem of the mathematization of knowledge questioned by Lévi-Strauss. Poststructuralism is a theory that pushes the point of what Lévi-Strauss called "human mathematics" further.

Indeed, the appropriation of French theories of cybernetics, which was active in the 1960s, is still relevant today, given that the rise of artificial intelligence and automation is reopening the issues that structuralism faced in the past. As an aesthetic form, so-called postmodernism is nothing more than the practice of the incommensurability of this French theory of cybernetics. When Jameson named postmodernism as the cultural logic of late capitalism, he may have had in mind the rise of 'digital capitalism,' the combination of cybernetics theory and capitalism that French theory—structuralism and poststructuralism—sought to problematize. In particular, the advent of the Internet in the 1990s, the development of the big data industry, and the rapid upgrading of computer technology have made it possible to look at many of the problems that were once considered intractable in cybernetics and information theory from a new angle. Whether the emergence of these new conditions represents a leap forward in technology beyond the limits of cybernetics and information theory that structuralism and postmodernism challenged or a return to the old future will require further discussion.

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