

# Exploring the Epistemology and Methodology of Social Sciences: From Positivism to Complexity

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The aim of the paper is to explore the main paradigms and methodology of social research, framing them in historical path and highlighting the epistemological foundations. It moves from reflection on research methodology as a ‘discourse of method’ to focus on the paradigmatic dimension of the social sciences, according to Kuhn’s meaning for which paradigm indicates a shared and recognized theoretical perspective within the scientific community. The paper highlights the role of paradigms in shaping theoretical and empirical inquiry. It further examines the positivist and neo-positivist paradigms, which emphasize observation and empirical verifiability, quantification, formulation of laws, and cause-and-effect relationships, arguing for the uniqueness of the scientific method. Lazarsfeld brings to the social sciences the language ‘of variables’, borrowed from mathematics and statistics. The distinction introduced by Windelband between ‘nomothetic’ and ‘idiographic’ sciences is followed by Weber’s elaboration of the concept of ‘*Verstehen*’, which shifts the focus to the understanding of social reality through the meanings that individuals attribute to their actions. The interpretive paradigm paves the way for qualitative research methods. Finally, the paper delves into the complexity paradigm, which challenges the reductionist and deterministic models of classical science and outlines an epistemological shift in the key notions of science, introducing concepts such as ‘emergence’, ‘auto-eco-organization’ and ‘recursive processes’. The complexity of social reality calls for a rethinking of sociological methods, favoring multidimensional and event-based analysis over statistical regularities, privileging observation, intervention and the ‘in vivo method’ on the level of empirical research. Complexity pushes sociology to redefine itself along with its object traditionally understood as ‘society’.

*Keywords:* paradigms in social research, methodological approaches, positivism and neo-positivism, interpretive paradigm and methodology, complexity paradigm

## Introduction

According to Corbetta (2014), the concept of “methodology” in social research refers to the meaning of “study” or “logic” of methods, which investigates rules, methodological principles, and formal conditions that underpin scientific inquiry within sociology and enable the systematization and advancement of knowledge in the field. For this reason, “research methodology” means “discourse of method” (Corbetta, 2014, p. 9), and is deeply connected to the paradigmatic dimension of the social sciences. While differing from critical reflection around scientific knowledge, methodology spans from speculation on issues such as explanation and causality,

induction and deduction to more operational concepts such as the reliability and validity of an operationalization procedure. Methodological reflection is closely intertwined with the field of social research techniques, as reflection on method can occur after the acquisition of technical awareness. As Weber (1922, translated in Rossi, 1958, p. 147) stated, methodology “can be a self-reflection on means that have found confirmation in praxis”.

### **The Paradigmatic Dimension of Social Sciences**

The concept of “paradigm” has ancient origin in philosophical knowledge, and in the 20th century, it gained epistemological significance in philosophical reflection on the so-called “hard sciences” and in the “historical-social sciences”.

Notably, during the 20th century, Thomas Kuhn (1962) investigated the historical development of the sciences and distinguished the times of “normal science” from the times of “extraordinary” i.e., revolutionary science, during which continuity with the past is broken and a new theoretical framework is constructed. The issues to be proposed to scientific inquiry and the criteria by which to define the issue are revolutionized. In other words, the “conceptual structure” that is, the “paradigm” through which scientists read and analyze the world is transformed.

In Kuhnian meaning, a paradigm encompasses more than a “theory” and represents a worldview, a interpretative framework that precedes theoretical elaboration, serving as a general framework within which specific theories are placed (Corbetta, 2014). The paradigm designates a theoretical perspective that is shared and recognized within the scientific community and grounded in previous acquisitions of the discipline. The paradigm directs research towards the identification of relevant facts to be investigated, the formulation of hypotheses within which to situate the phenomenon studied, and empirical research techniques.

The stages of a scientific discipline characterized by a particular paradigm widely shared by the scientific community are defined by Kuhn as “normal science”. During this phase, science progresses in a linear and cumulative manner.

Shifting the discourse to the social sciences, the question of the existence of a paradigm shared by the community of sociologists arises. Currently, the social sciences understand “paradigm” as an overarching theoretical perspective or “fundamental image that a discipline has of its object” (Friedrichs, 1970, in Corbetta, 2014, p. 17).

Reviewing a historical overview of the key perspectives that have emerged over the evolution of social sciences, Corbetta (2014, pp. 18-19) analyzed the foundational paradigms of social research that have laid the foundations for the operational procedures that have informed empirical research and identified two frameworks that have “historically oriented” social research: the “empiricist” or “positivist” view in its 19th-century version, and “neo-positivism” in its more recent 20th-century version, alongside the “humanistic” or “interpretivist” view.

These are two comprehensive visions of the nature of social reality, ways of knowing it, and techniques of social research.

#### **The Paradigm and Methodology of Positivism**

The positivist paradigm and thought accompanied the birth of social sciences and sociology. Sociology began to take shape when social reality became an object of study, and the guiding paradigm was that of the

natural sciences, based on a deep trust in them and introducing the concept of the uniqueness of the scientific method. Key concepts include “natural law”, “cause-and-effect”, “empirical verification”, and “explanation”. Quantitative variables and measurement procedures are the primary techniques of observation and measurement.

The attempt to translate the theoretical perspective developed by Comte into terms of research and empirical practices was carried forward by Durkheim (1969), who is considered the “first social scientist” and the first positivist sociologist. Empirical practice is grounded in what Durkheim calls as “social facts”.

Social facts are seen as “things” of the natural world, not subject to human will but conditioning and limiting individuals. Like natural world phenomena, social facts function according to deterministic rules that social scientists can discover through scientific research. Social reality is governed by objectively studied laws.

Social reality exists outside of the individual and can be objectively known using the methods of the natural sciences, following the principle of methodological unity between the natural and social worlds. The positivist method is inductive, proceeding from empirical observation of the “particular” to generalization and the formulation of universal laws by identifying regularities and uniformities within social reality.

### **The Paradigm and Methodology of Neo-positivism**

As Corbetta (2014) noted, during the 20th century, the positivist perspective undertakes a process of revision aimed at overcoming the enthusiasm for scientific knowledge as the only valid and effective approach in all fields of knowledge. Twentieth-century positivism, or neo-positivism, is a complex and multifaceted movement. Neo-positivism retains the assumption of ontological realism—that is, the belief that the world exists independently of the knowledge of the human being. It emphasizes empirical observation as the primary means of understanding both natural and social reality.

Neo-positivism emerged as a movement within the “Vienna Circle”, and develops as logical positivism. Central to neo-positivism are epistemological issues, reflections on the methodology of natural and social sciences, with a focus on empirical verifiability and the intersubjective control and verification of theories. In the social sciences, social reality is expressed using a language derived from mathematics and statistics, referred to by Lazarsfeld (1967) as the “language of variables”. According to this perspective, variables are characterized by neutrality, objectivity, and operationalizability, becoming key elements in social analysis.

Every social object is analytically defined on the basis of a set of variables or properties, and social phenomena are analyzed in terms of relationships between variables, without proceeding to the recomposition or unification of the original individual or phenomenon. Social phenomena are measured, correlated, and formalized, and theories are objectively validated or falsified. The procedures of operationalization, measurement techniques, mathematical formalization, and statistical inference become integral to social analysis, alongside the spread of techniques such as attitude scales, random sampling, mathematical modeling, multivariate data analysis, and causal models.

In the early 20th century, developments in the natural sciences, particularly in physics, quantum mechanics, Einstein’s relativization of space-time, and Heisenberg’s uncertainty principle introduced the concepts of probability and uncertainty. These advances pushed to go beyond the concept of deterministic laws and led to the introduction of the concept of probability. From an epistemological perspective, Popper (1934) contrasted the principle of verifiability with the criterion of falsifiability, which results in a hypothetical and conjectural view of theories that, due to their logical structure, remain falsifiable.

In this context, the post-positivist orientation emerged, which views empirical observation and perception of reality not as an objective snapshot but as theory-dependent i.e., observation is always shaped by a theoretical framework. This new understanding of knowledge asserts that the act of knowing is influenced by social and cultural circumstances and by the theoretical framework of reference. In this way, the idea of a clear-cut distinction between theoretical concepts and observed data, as well as the notion of neutrality and intersubjectivity in observational language are eliminated.

What unites positivism, neo-positivism, and post-positivism is the “empiricist foundation”, that is the centrality of the scientific method in social research and the analogy between the methods of social and natural sciences (Corbetta, 2014, p. 28). The empirical approach maintains the use of observational language, operationalization, quantification, and generalization. Operational procedures, data collection methods, measurement operations, and statistical elaboration do not undergo fundamental changes; thus, the operational and procedural framework remains largely the same. Quantitative techniques remain central, although there is an openness to qualitative techniques.

### **The Paradigm and Methodology of Interpretivism**

At the beginning of the 20th century, Max Weber introduced the concept of “*Verstehende* sociology”, followed by a reinterpretation beginning in the 1960s, particularly in American sociology, leading to the development of symbolic interactionism, phenomenological sociology, and ethnomethodology. Corbetta (2014) grouped all theoretical perspectives under the term “interpretivist”. These theoretical conceptions hold that reality cannot simply be observed, but must be interpreted. This view of social science can be traced back to the German philosopher Wilhelm Dilthey, who critiqued Comte’s scientism by asserting the autonomy of the human sciences in relation to the natural sciences. In his work *Introduction to the Human Sciences*, Dilthey (1989) distinguished between the natural sciences and the human sciences based on the relationship between the researcher and the studied reality.

The cognitive process of the natural sciences aims to investigate and discover causal laws and takes the form of “explanation”. In the social sciences, there is no detachment between the observer and the reality studied, meaning that social sciences can only proceed through the form of “understanding” (*Verstehen*). During the same period, Windelband introduced a distinction between “nomothetic” sciences—aimed at identifying natural laws—and “idiographic” sciences, which seek to capture the individuality, uniqueness, and unrepeatability of phenomena. Weber brought the concept of *Verstehen* into sociology while preserving the objectivity of social science in terms of its “value-neutrality” (*Wertfreiheit*), i.e. independence from value judgments, and the generality of its statements. According to Weber, social sciences are distinguished from natural sciences by their orientation towards individuality (Rossi, 1958, p. 21). The method of the historical-social sciences is one of understanding, which seeks to comprehend the motivations behind actions and the meanings that individuals attribute to their actions and behavior, which has its own rationality. The starting point is the individual and the meaning of his action, and it is possible to achieve objective knowledge with character of generality through Weber’s concept of the “ideal type”. The ideal type is “an abstraction arising from the empirical observation of regularities” (Corbetta, 2014; Weber, 1904, translated in Rossi, 1974).

In interpreting social reality, the researcher identifies regularities or causal connections or “statements of possibility” (Boudon, 1984), which should not be confused with laws. In this way, Weber replaces causal laws, characterized by generality and necessity, with statements that have the characteristic of specificity and

possibility. At the center of social phenomena is the meaningful individual action. From this perspective, the motivational and intentional components of individual actions become the primary object of social research, distinguishing the historical-social sciences from the natural sciences. Consequently, sociological research involves different techniques and procedures, which cannot adopt the language of variables. This subjectivist approach develops research procedures, methods of observation, and analysis of social reality that give rise to qualitative research.

### **The Complexity Paradigm and Methodology**

Current transformations of society bring the issue of social complexity and refer back to the relationship between sociological science and its own object of study. The systemic or “neo-systemic” understanding of complexity (Urry, 2005) offers effective concepts for an original interpretation of “the social” and for the analysis of contemporary society. Categories such as “emergent properties”, “auto-eco-organization”, “Order from Noise”, “Order from disorder”, “Unitas multiplex” (Prigogine & Stengers, 1979; Monod, 1970; Atlan, 1974; Maturana & Varela, 1980) constitute a particularly effective interdisciplinary field for studying today’s complex and global society (Contini, 2017; 2019; 2023). Complexity pushes social science to redefine itself alongside its object of study and raises the issue of affirming the historical nature of “society”, while moving beyond the naturalistic conception of society.

The complexity paradigm is outlined through an epistemological shift in key scientific notions, such as the concept of law, necessity, or order (Ceruti, 1985; 2014), which entails a revisitation of the conceptualization of modern science, which is traditionally based on the identification between “order”, “intelligibility”, and “science” (Morin, 1984; Contini, 2006; 2013; 2019). The conceptual foundations of the modern paradigm of science establish the scientific nature of disciplines on their ability to determine invariant laws through mathematical and quantitative formulations. This approach eliminates the local, the singular, the event, and the contingent as residual, reducing complexity to simplicity, isolating the object from its environment, separating the object from the subject.

Within this paradigm, Morin (1984; 2018) proposed “Complex Sociology”, which is based on three principles: the dialogic, the recursive, and the hologrammatic. Furthermore, complex sociology connects concepts often dissociated in sociological theory, namely global unity, constraints, antagonism, and auto-eco-organizing system. In this way, complex sociology emphasizes key social features that have been neglected by sociological theory and ties them together by correlating the issue of internal reorganization and the self-generative principle, as well as the issue of disorganization and the growth of entropy. Thus, complex sociology recognizes the multifaceted disorder within social organization, integrating the very high human complexity.

From a methodological point of view, the complex and multidimensional approach in sociology focuses on the phenomenon and the event rather than the variable, on the crisis rather than the statistical regularity. Therefore, on the level of empirical techniques, complex sociology seeks to privilege observation and intervention. The phenomenon is seen as an “emergence”, that is, as datum or a set of data that emerges from an event or a series of interconnected events. The event represents something “new”, i.e., the information that cannot be reduced to statistical regularities. Methodologically, the event-as-information is un-structuring in the sense that it generates multiple questions and disrupts systems of rationalization. In this way, event-as-information provides insight into the functioning of the system. The two methodological focal points

for studying the event concern the processes of modification and reabsorption triggered by the event and the emergence of new events and processes.

In other words, complex sociology stands in opposition to a sociological method that aims to eliminate the event in order to achieve formalization and mathematization of statistical regularities. Instead, it focuses on observing everything that is accidental and random. The Morinian method opposes a sociological or mechanistic method aimed at eliminating perturbations and imbalance by considering them unscientific. Morin (1984) called this method “in vivo investigation”, which implies the full employment of research techniques such as observation, participation, and intervention. It considers the observer’s role in a recursive relationship with the observed phenomenon, emphasizing the indissolubility and mutual contamination of the subject-object pair. In this way, the sample-based questionnaire can only serve as a means of verification at superficial levels. One could say that complexity pushes sociological science to redefine itself alongside its object, namely social reality. Within the complexity paradigm, what were once considered the non-scientific residues of the human and social sciences become integral to the fundamental issue of scientific knowledge.

### Conclusions

Sociological science has been redefining its tools, fields, and objects of study. Positivism and neo-positivism emphasize the empirical foundation of sociological knowledge and employ concepts of “social facts”, “cause-and-effect”, “variables”, and “empirical verification”. The interpretive paradigm values the meaning attributed to individual actions and rationality. In this context, the complexity paradigm emerges as a response to the challenges posed by the multidimensional and dynamic nature of contemporary social reality.

By centering on events, emergence, information, and systemic interaction, complexity challenges the reduction of reality to deterministic laws and simplified models, promoting a complex methodological approach based on dialogic, recursive, and hologrammatic principles that privileges observation, intervention, and the *in vivo* investigation. This shift pushes sociology to overcome the traditional separation between subject, object, and environment. Thus, the “complex sociology” proposed by Morin represents a perspective that integrates order and disorder, recognizing the richness and irreducible complexity of social auto-eco-organization.

The path of sociological paradigms suggests how social science continually questions itself in response to societal changes. The challenge of complexity opens new possibilities for sociological research and knowledge, offering epistemological, conceptual and methodological tools capable of understanding the uncertainty and complexity of contemporary social reality.

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