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## EMPIRICAL THEORY

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The pursuit of empirical theory was a key component of the post-World War II behavioral revolution in American political science, and it continues to occupy an important place in the discipline to this day. It is framed by two core beliefs. The first belief assigns theory a pivotal role in social science: Theory is needed to focus the choice of empirical research topics and to integrate the results of such research. The second belief prescribes features that theory should display if it is to successfully play this role. It must logically distinguish between *is* and *ought* statements and articulate an analytical framework of concepts and relationships characterizing what is. Empirical theorists hold various views regarding the role, if any, of questions about what ought to be in social science. But they agree that their own theoretical endeavors can and should proceed at some remove from such questions of normative theory. Their proposed division of labor—which sets up empirical theory as a separate province of theoretical work—receives different receptions in different parts of American political science. It is widely accepted in most subfields of the discipline, but many scholars in the subfield of political theory find it problematic.

A variety of empirical theories flourished during the decades after World War II. Some theories were pitched at the macro-societal or even global level; others were more micro-oriented, taking individuals or groups as their key units of analysis. Some were general theories meant to apply universally at all times and places; others were framed as theories of the mid-range, limited in their range of applicability. Prominent examples within American political science during the 1950s and 1960s included David Easton's systems theory, Robert Dahl's pluralism, and Gabriel Almond's structural-functionalism. While these specific theories were criticized and lost favor during the 1970s, the beliefs motivating the pursuit of empirical theory outlasted the early examples of this pursuit. These beliefs continue to underlie what most American political scientists today have in mind when they extol the importance of building and testing theory.

An ambiguity with regard to empirical theory concerns its relationship to positive theory.

Sometimes, these phrases appear synonymous, but sometimes they are contrasted. The ambiguity here can be clarified if we consider criteria that theories might strive to meet. Empirical and positive theorists share a modernist view that the progress of social science is served by theories that avoid appealing to moral criteria, and they are willing (or eager) to supplant ordinary language with more technical vocabularies. They agree, moreover, that theories should be internally consistent and give rise to empirically testable claims. But where empirical theorists tend to stress the latter criterion, positive theorists combine a greater stress on consistency with a more stringent view of what it demands; they see a formal axiomatic system, making possible the use of deductive logic, as a prerequisite of meeting the consistency criterion.

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*See also* Behavioralism; Dahl, Robert; Functionalism; Pluralism; Positive Theory, Systems Theory; Value-Free Social Science

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## EMPIRICISM

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Empiricism is an epistemological doctrine that regards sensory information as the exclusive basis of all knowledge. Nothing in the mind was not first in the senses. For purposes of tracking the influence of empiricism on social theory, empiricism receives its canonical formulation at the hands of David Hume. With Hume, empiricism becomes the fundamental criterion for arbitrating the possible meaningfulness of statements. This leads directly, in the fullness of time, to the view that the only evidence that bears on the truth or falsity of claims

made by social theories can be observable (empirical) evidence. Thus, empiricism comes to exert a determinative influence early in the twentieth century on what counts as necessary for evaluating any social theory. Yet, the twentieth century also witnesses both the apotheosis and philosophical transformation of Humean empiricism.

Hume (in)famously advises that any subject that did not provide statements that were, to speak anachronistically, definitional entailments or provable by or reducible to sensory data should be consigned to the flames. All candidates for human knowledge, on this view, can establish their credibility, that is, their ability to be rationally evaluated, in exactly one of two mutually exclusive ways. The first would be to establish their truth as a consequence of “relations of ideas”—for example, logical or mathematical truths and (more dubiously) analytic truths. This tradition views the truth of, for example,  $7 + 5 = 12$  or the statement, all bachelors are unmarried, as being ascertained without any recourse to empirical test and solely by virtue of the meaning of the components of the assertion.

The second alternative requires that all truth claims must be verified by experience. Logical form in these cases reveals just what aspects of the statement must be true for the whole statement to be true. Nothing else besides reducibility to or testability by experience could count for demonstrating that a statement asserts something other than what Hume derides as “sophistry and illusion.”

### The Apotheosis of Empiricism: The Positivist Empiricist Criterion of Meaning

The significance of Humean empiricism for the social sciences comes filtered through key doctrines of logical positivism. The positivists sought to accomplish in detail what Hume insisted on only in principle: to demonstrate how all human knowledge was built from initial sensory elements. The logical positivists expected to develop a method that would ultimately account for all human knowledge of the world on a sensory basis, from the ordinary to the most abstruse, such as physics. The verifiability criterion of meaning (VCM) captures the core of the positivist program in this regard. The VCM maintained that any meaningful statement could be sorted, by virtue of

its logical form alone, into one of three logical types: contingent (possibly true or false); tautologous (always true by virtue of its logical form alone); contradictory (always false by virtue of its logical form alone).

The VCM implies that if a statement is not determinably true or false by virtue of its logical form, then it has a meaning if and only if analysis of its logical structure reveals the empirical (experiential) conditions that would determine its truth or falsity. Verification by means of sensory experience is what empiricism is with regard to the meaning of theoretical statements in any science, natural or social. Empiricism requires that any statement about the world must in the end bear fruit by revealing what in experience would show it to be true or false.

Statements taken to fail this standard of meaningfulness include, for example, the absolute is manifest, murder is wrong, and the Taj Mahal is beautiful. What they purport to assert cannot be determined to be objectively true or false (i.e., true of that thing and not just of one’s reaction to it) by any possible experience. Hence, the sentences are literally meaningless. If a statement has no meaning in terms of how things stand in the world, it has no meaning, full stop.

As applied to the social sciences, logical positivism was most congenial to approaches such as behaviorism, which proposed to simply “black box” all concerns about or inquiries into cognitive processes or meanings. Consigned to the flames from this perspective were, for example, almost all interpretative approaches to the study of social phenomena. If “thick description” connotes detailed understanding of the “native’s point of view,” an empiricist approach favors what might be termed “thin descriptions.” For example, modeling people’s behavior using the axioms of decision theory requires no assumption about what this or that means to any individual. If people are rational, on this view, the model will capture the gross behavior. The rest is extraneous.

History and anthropology looked particularly anemic in terms of their scientific or empirical credentials from this perspective. Insofar as historians sought to reconstruct the past *wie es eigentlich gewesen ist*—“as it actually was”—historians trafficked in unverifiable claims. There was no traveling back to verify that any historian now

described matters correctly. Likewise, to speculate on the meaning of this or that custom or ritual was to venture into what actually went on in the black box and so, too, to drift off into a realm where empirical evidence did not exist. More generally, ethnographic and historicist approaches failed to generalize, and this made it difficult to test imputed meanings. But lack of testability simply added to the ways in which such approaches sinned against empiricism.

Empiricism, in the form given it by the logical positivists, set a very stringent standard for meaning. Indeed, it was unclear that any of the social sciences met the bar set by positivism for producing scientific knowledge. Worse, it was quite unclear that some disciplines could clear this bar. The VCM, for all of its intuitive plausibility, excluded not only certain areas of inquiry long thought meaningful—aesthetics, ethics, metaphysics—but also what appeared to be empirical research.

### The Revenge of History

Empiricism as a philosophical doctrine was ultimately undone by its advocates. This constitutes one of the great philosophical ironies of all time, and it remains as a lasting tribute to the philosophical insight and intellectual integrity of empiricism's greatest exponents—the logical positivists. Consider the following example (from Carl Hempel). Tubercular sputum is observed under a microscope. What tells the observer that these rod-shaped objects are the agents of tuberculosis? If a person walks into a room and sees a certain arrangement of instruments, what in perception tells them that this arrangement constitutes an experimental apparatus? Even the most empiricist-minded philosopher of science came to realize that “seeing” was influenced by theory. A person's training—the background knowledge brought to a specific situation—determined what would or could be seen.

With regard to the understanding of individual sentences, this relationship of the views (theory) held by a perceiver and the objects encountered in experience implied that the understanding of any one sentence already presupposed a knowledge of “the meaning” of other sentences. Perceivers could not learn the meaning of statements in isolation from learning the meaning of related statements as

well. Even the seeming prototype of an individually identified statement meaning, for example, this is red (said while pointing at a red object), implies that the perceiver knows how to discriminate red from other colors, knows under what conditions it makes sense to agree that something is perceived as being a particular color, understands the act of ostension, and so on. A dogma of empiricism—an unexamined article of empiricist faith—held that the empirical meaning of statements could be determined by evaluating statements taken one-by-one. This turns out not to be a correct picture of how statements can be said to have a meaning. To know the meaning of any one statement seems to require knowledge of how this statement relates to others. The interanimation of statements, in turn, mediates what counts as experience.

A further and related blow to the statement-centered empiricist account of meaning arose from studies in the history of science. Empiricists held science to be the paradigm of rational inquiry. On this model, both individual beliefs (e.g., scientific hypotheses) and whole theories were accepted or rejected by comparing statements implied by a theory against what experience reveals. However, the history of science manifests a rather different picture of this relationship between experience and belief. Indeed, the historical picture reverses the order of knowing assumed by empiricism. Belief determines what in perception is correct and not vice versa. As a consequence of the interdependence of statements discussed above, theories shaped the very perception of what might count as evidence. One could not observe microbes by looking through a microscope if one had no way of integrating what one observes into a more informed understanding of these observations as those things. Nothing in the mere act of looking determines foreground and background, items of significance from mere “noise.”

Moreover, it was noted, when theories changed, what was observed changed as well. A frequently discussed case here concerns the shift from Ptolemaic astronomy to Copernican theory. What moved and what did not was altered, not because new observations were made but because the account of existing observations altered. What heavenly bodies existed, what was a star, and what was a planet underwent similar alterations at the behest of changes in theory. The observed furniture

of the universe now was deemed to shift with changing theoretical fashions. The reasons for accepting or rejecting a scientific theory were likened to *gestalt* shifts, changes of perception that occur not because anything in the field of vision changes but because of a shift that occurs in the perceiver. The primacy of the empirical gave way, under this assault, to the primacy of theory. It was no longer to be unproblematically assumed that truth was wrested from unwilling nature by experimental probing. Rather, theories inform what one sees and so what one comes to expect. Perception of what there is follows suit. Evidence ceased to be a test of theories and instead became artifacts of theories held for other reasons.

In the context of this assault on the empirical as a guide to truth, the sociology of science arose. If philosophical models of theory testing and evaluation that stressed the role of the empirical did not determine to which theories scientists allied themselves, what did? “Social interests!” answered the sociologists of science. The claim was that nothing in experience could logically compel the scientific community to renounce one particular theory and accept another. Sociological studies of various areas ranging from high-energy physics to biological laboratories yielded a rich and controversial picture of laboratory life. Ethnographic approaches to how scientists negotiated differences in practice provided a very different picture of how the scientific picture of the world comes to be crafted and scientific theories come to be accepted. The *empirical* itself becomes a theorized notion, and so one incapable of offering a neutral arbiter of the correctness of a theory or a belief. “Evidence” devolves into being an afterthought of theoretical positions.

At the same time that the sociologists of science were proclaiming that the empirical is too weak a reed on which to construct any account of scientific theory acceptance or change, a parallel revolution was taking place in the philosophy of science. This approach focused on laboratory practice instead of the formalization of theories in the manner of the positivists. But the philosophical accounts of laboratory work departed markedly from those crafted by the sociologists of science anxious to discount the voice of experience in the conversation of inquiry. Rather, emphasis fell on how agreement was fashioned in laboratory contexts

through convergence of various scientific practices. No one factor, including the evidence, might determine which theoretical approach to favor. But a number of factors could and did have a cumulative effect in one direction rather than another. Closer examination of laboratory work allowed accounts to move away from a view of scientists as caught up in a “mob psychology” and toward a more complex yet empirically grounded account of enquiry. In the process, the notion of the empirical expanded to include the practices—for example, instrumentation, training—involved in how scientists produce the results that bear on the theories they endorse.

Within philosophy of science, empiricism has evolved from its Humean status as the foundation of all knowledge to that of a hypothesis that explains why science works as well as it does. Logical positivists emphasized and debated about “observation sentences,” but doubt existed even then regarding exactly how to characterize the notion of observation. Empiricism has now become a theory of the sort of evidence to be favored by scientists, and not an independently determined basis of evidence for belief. Social scientists, in turn, should draw certain lessons from the debates that raged, first among the positivists themselves regarding the status of the empirical and later between sociologists and philosophers of science. What comes to be counted as evidence and why cannot be treated as some neutral, unproblematic view of what there is. The lesson in all of this is that the tie between theory and evidence—belief and the world—runs both wide and deep.

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*See also* Empirical Theory; Explanation; Historical Understanding; Methodological Individualism

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## ENCYCLOPÉDIE

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In its completed version, the *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers* comprised 17 volumes of articles and 11 volumes of illustrations, published in Paris between 1751 and 1765. The work was intended to represent the most advanced state of contemporary knowledge in every discipline conceivable, ranging from natural history and mathematics to religion and philosophy to the mechanical arts. Authors with special expertise across the range of subjects were recruited to write articles. Moreover, it was hoped that the careful organization of the project would reveal to its readers the connections and interrelations among the various branches of knowledge. The *Encyclopédie* was initially coedited by two well-known philosophes, Denis Diderot and Jean Le Rond d'Alembert, until d'Alembert resigned from the project in 1758, leaving Diderot the sole editor. It is often regarded as the first modern encyclopedia and one of the signal works of the Enlightenment, representing its loftiest ideals and aspirations, including its political philosophy.

That the *Encyclopédie* was a work of scholarly collaboration expressed the solidarity and power of so-called men of letters in eighteenth-century

France. In addition to Diderot and d'Alembert, many of the best-known thinkers of the century, including baron de Montesquieu, Voltaire, Jean-Jacques Rousseau, and the leader of the Physiocratic school, François Quesnay, contributed articles. The most frequent contributions came from a core group of relatively radical philosophes. Against the solitary man of genius working alone in his attic, the philosophes believed that scholarship was a social and collaborative enterprise, and they often regarded themselves as a coherent intellectual movement, a republic of letters, working together to improve society through the use of critical reason. They regarded themselves as educators and popularizers, diffusing throughout society not only specific articles of knowledge but also techniques of thinking critically. Thus, although the overtly political articles in the *Encyclopédie* did not explicitly undermine political absolutism, the very technique of its writing expressed increasingly democratic principles of cooperation, collaboration, and mutuality.

The plans for the *Encyclopédie* were initially far more modest. André-François Le Breton, a French publisher, originally conceived the project as a French translation of Ephraim Chambers's *Cyclopaedia* of 1728. Chambers's *Cyclopaedia*, although the most comprehensive and ambitious such work when it was published, was more akin to a modern dictionary than a modern encyclopedia. Le Breton quarreled repeatedly with his British partner, John Mills, who was originally contracted to perform the translation. Shortly after Mills was dropped from the project in 1745, Diderot and d'Alembert joined in his stead, initially as subordinates but eventually as chief editors. Under their stewardship, the scope of the project was expanded enormously, until it became an independent venture distinct from the translation of Chambers's *Cyclopaedia*.

The publication history of the *Encyclopédie* was long and tortuous. The project was constantly beset by troubles, even prior to the publication of its first volume. In 1750, Diderot's *Prospectus* already attracted negative attention from the *Journal of Trévoux*, a Jesuit periodical. This initial confrontation may be seen as emblematic of the difficulties faced by the *Encyclopédie* throughout its 14-year publication history. However, the circle of enemies and critics expanded well beyond