

Science Wars:

When the May 1996 issue of the journal *Social Text* appeared, an issue devoted to the understanding of “Science Wars,” the editors became targets in these “wars” in ways they had not imagined. The issue included a bogus article by New York University mathematical physicist Alan Sokal, who feigned an earnest reflection on the political and philosophical implications of recent physics research for cultural studies. Sokal revealed the hoax himself, and it immediately became a hotly debated issue in academic and popular media around the world. The appearance of the article was not only taken as a sign of shoddy scholarship by the *Social Text* editors but as an expose of cultural studies and social science in general. For instance, Nobel prize-winning physicist Steven Weinberg used the hoax to identify what he calls a fundamental “opposition” between natural and social scientists, especially regarding what Weinberg sees as dangerous anti-rationalism and relativism in social science and cultural studies. Those on the other side of the “wars” countered by criticizing Sokal [for iterating a] “reductionist view of science.”

The year before Sokal’s hoax, the “wars” had raged over the scientific status of a high-profile US National Opinion Research Center study, which had been launched as a “definitive survey” of sexual practices in the United States. Here, too, doubts were raised not only about the status of scholarship of the study in question, but of sociology and social science as such. The study had received the doubtful honor of becoming the topic of an editorial in *The Economist* under the heading “74.6% of Sociology is Bunk.” In *The New York Review of Books*, Harvard biologist and statistician R. C. Lewontin criticized the researchers behind the study for believing what people said when filling in the survey questionnaires on which the study builds. “It is frightening,” Lewontin wrote, “to think that social science is in the hands of professionals who are so deaf to human nuance that they believe that people do not lie to themselves [and to others] about the most freighted aspects of their own lives.” Lewontin concluded his review by warning social scientists that in pretending to a kind of knowledge that it cannot achieve, “social science can only engender the scorn of natural scientists.” Other social science critics participating in the debate talked of “dumbed-down” sociology and social scientists’ “physics envy.” The authors of the NORC study responded in kind by calling Lewontin’s review “professionally incompetent” and motivated by an “evident animus against the social sciences in general.” The authors also observed that the notion that an economist or a sociologist should review work in population genetics, one of Lewontin’s fields of competence, “would properly be greeted with derision.” [This] leaves us wondering ... what it is regarding natural and social science that makes it fairly common practice for natural scientists to review social science, whereas the opposite is less common.

Is the 'science' in social sciences the same as the 'science' in natural sciences?

[O]ne confronts [a question], which is as old as the very concept of science itself, and which continually reappears in discussions of the scientific enterprise: can the study of humans and society be scientific in the same manner as the study of natural objects? Can we speak of a unified science, or should natural-science inquiry and social-science inquiry be viewed as two basically different activities?

The history of science shows these questions to be both difficult to answer and controversial. The controversy is due partly to the fact that besides having fundamental methodological consequences, these questions touch on sensitive factors such as the status of social science in relation to natural science, as well as what the philosopher Richard Bernstein calls, "Cartesian anxiety," that is, the fear of ending in relativism and nihilism when one departs from the analytical-rational scientific tradition that has dominated Western science ...

The theoretical ambition

The natural-science model has been, and continues to be, an ideal shared by several traditions in the study of human activity ... Although it has now been argued that the ideal does not even work for the natural sciences, and even though the natural sciences and the technologies they have generated have shown themselves to be far more costly and hazardous locally and globally than assumed just a few decades ago, it is easy to understand why the natural-science ideal over time has been so attractive to so many scholars. There is a logical simplicity to the natural science paradigm, and the natural sciences' impressive material results speak for themselves: these sciences certainly have an undeniable basis as a means by which we have attempted to achieve mastery over nature, technology, and over our own conditions of life. In this interpretation advances in natural-science research and technological progress are founded upon a relatively cumulative production of knowledge, the key concepts being explanation and prediction based on context-independent theories. The consequence of this knowledge production is a strong, prestigious position for natural science in society.

In this sense, it is not surprising that many who study human affairs have attempted to imitate the natural science paradigm. ... In the *Paris Manuscripts*, Marx thus expresses his faith in a future unified science: "natural science will in time subsume the science of man just as the science of man will subsume natural science: there will be one" ... Freud, too, early in his career, was as optimistic as the young Marx. Freud's declared goal was "to furnish a psychology that shall be a natural science: that is, to represent psychical processes as quantitatively determinate states of specifiable material particles, thus making those processes perspicuous and free from contradiction." Later on, Freud continued to view the natural sciences as an ideal worth striving for, but he became more skeptical about how far one could go in approaching this ideal within psychology and psychiatry. "I always envy the physicists and mathematicians who can stand on firm ground," Freud later said, "I hover, so to speak, in the air. Mental events seem to be immeasurable and probably always will be so."

Lesser thinkers than Marx and Freud have looked, and continue to look, to the natural sciences as their ideal for the study of human activity. If anything, the idealization of the natural sciences has become more pronounced since Marx and

Freud. This applies ... also to areas of research not normally associated with the natural science model. The fact that Marx and Freud erred in their ambitions about developing their sciences into natural sciences is perhaps not so interesting today. But the general question of whether the natural science model is an appropriate ideal for the study of human activity remains timely. The question remains: must the “science of man” be different from natural science?

The natural sciences are relatively cumulative. Thomas Kuhn’s famous phenomenological evolutionary scheme for the natural sciences contains long periods with stable normal science; that is, periods with a generally accepted mode of conducting research. The researcher’s work in such periods consists according to Kuhn in what he calls “puzzle solving” within the framework of a common, accepted “paradigm.” The stable periods of normal science are at times broken by periods of radical instability and “revolutionary” change. After a time, change leads to a new paradigm, to cumulative replacement in which the old paradigm becomes superfluous.

Periods with scientific revolutions are a consequence of periods with stable, normal-science research, in that it is via the daily normal “puzzle solving” that the anomalies and contradictions appear which gradually undermine the original paradigm. The resulting crisis continues until the anomalies and contradictions can be explained within a new paradigm; that is, until researchers experience “the pieces suddenly sorting themselves out and coming together in a new way,” to use Kuhn’s words. The result is a new paradigm around which there is again general agreement and on the basis of which normal-science research can again be conducted.

Kuhn’s now-classic description of the research process was criticized for introducing an element of relativism within the natural sciences and in the theory and history of science, a critique which has recently been restated by physicist Steven Weinberg.

Kuhn apparently activated the Cartesian anxiety of natural scientists and of philosophers and historians of science. ... The matter is far from settled, but it is clear for most observers, that even though natural-science theory, following Kuhn, cannot be seen as entirely so constant and cumulative as previously assumed, there is still room for a degree of stability and progress for these sciences, also in a Kuhnian interpretation. Therefore the ambition has continued to be to emulate the natural science model in the study of human affairs, especially as regards the development of theory which is typically seen as the pinnacle of scientific endeavor.

Hermeneutical stumbling blocks

Since Kuhn’s *The Structure of Scientific Revolutions*, natural science has been further relativized via what could be called the “universality of hermeneutics” ...

Whereas hermeneutics according to Wilhelm Dilthey and, in part, to Max Weber was regarded as an activity linked only to the study of human activity, it is now argued that the natural sciences are also historically conditioned and require hermeneutic interpretation. In other words, the natural science ideal cannot even be found in the natural sciences themselves. Natural scientists, too, must determine what constitutes relevant facts, methods, and theories; for example, what would count as “nature.” These determinations are made on the basis of a common interpretation of what constitutes scientific work. Interpretation tends to occur implicitly, but is, nevertheless, interpretation. It is acquired as tacit practical skills and conventions via

training in the actual performance of scientific activity.

Possession of these skills is a requirement for being able to undertake scientific work at all, and performance occurs without reflection. One can produce and reproduce objective results from these skills, but one cannot argue objectively for the skills. Methodology is not a universal theoretical rationality and can never be argued to be so because one ends in infinite regress: how does one argue theoretically for the practical skills one uses to formulate a theory? How does one determine scientifically what science is?

The answer is that one cannot. Methodology is a concrete practical rationality. In this sense, the natural sciences are just as lacking in objectivity as the social sciences. This has led [some] to conclude that the two branches of science are not essentially different. It must be concluded, however, that despite the argument of the universality of hermeneutics and despite the common conditions in the form of epistemological relativism, which is argued to be valid for both natural and social sciences, it can be phenomenologically demonstrated that the natural sciences are relatively cumulative and predictive, while the social sciences are not and never have been. In other words, on the basis of the universality of hermeneutics, it is incorrect to underplay the differences between natural and social sciences ...

The social sciences do not evolve via scientific revolutions, as Kuhn says is the case for the natural sciences. Rather ... social sciences go through periods where various constellations of power and waves of intellectual fashion dominate, and where a change from one period to another, which on the surface may resemble a paradigm shift, actually consists of the researchers within a given area abandoning a “dying” wave for a growing one, without there having occurred any collective accumulation of knowledge. Not paradigm shifts but rather style changes are what characterize social science: it is not a case of evolution but more of fashion. ...

The social sciences have always found themselves in a situation of constant reorganization, characterized by a multiplicity of directions. It is not a state of crisis in a Kuhnian sense, that is, of a period with competing paradigms located between periods with normal science. The condition of the social sciences has been termed “pre-paradigmatic,” if we remain in the Kuhnian terminology. The social sciences have always been in this state and as a result are neither relatively cumulative nor relatively stable. Why are the social sciences characterized by such instability? Is it immanent, or can it be transcended? Why have the social sciences not been able to develop predictive theory to the same degree as the natural sciences? These are the questions which we will now attempt to answer.

Pre-paradigmatic sciences

To maintain that the study of humans and society finds itself in a pre-paradigmatic stage is to imply that a coming “maturation” of the social sciences will produce a more desirable paradigmatic stage characterized by normal science. It is argued that the study of human society is somewhat younger than the natural sciences; the social sciences have not benefited from the same resources as has the study of nature; their object of study – human activity – is more complex; their conceptual apparatus and research methods need to be more refined; and with more time for further development and refinement, there should, in principle, be nothing in the way of the

social sciences achieving the same paradigmatic stage as the natural sciences, becoming cumulative, stable, and predictive. This is the essence of what is here called the “pre-paradigmatic argument.”

It follows from this line of thinking that there is a fundamental distinction between normal and non-normal science, a distinction which cuts across the boundary separating the study of human affairs on the one hand and the study of nature on the other. ...

According to the pre-paradigmatic argument, both the natural and the social sciences may find themselves in periods where they are cumulative, stable, and predictive, and both may also experience periods with confusing and incorrect predictions. The immature state of social science on which this argument is based has nothing to do with fundamental properties of human beings or of social science. For example, even though political scientists may disagree as to what constitutes “the political,” while physicists seem to be in more agreement as to what constitute physical phenomena, this state of affairs does not necessarily have to remain permanent. According to the pre-paradigmatic argument, there is nothing in principle which prevents political scientists from being able to reach agreement concerning the political domain, nor physicists from again disagreeing as to the basic categories of nature, as they did when quantum theory first appeared.

The pre-paradigmatic argument is seductive. First because it entails a high degree of methodological clarity for the study of human activity, where, following the argument, it models itself on the natural sciences’ well-developed and well-tested methodology for theory development. Second, the natural sciences have had inordinately great success with their methodology. Could the social sciences achieve similar results if they developed their research methods sufficiently far along the natural science path? Yes, the argument goes. It is therefore not surprising that the pre-paradigmatic argument is popular among many social scientists. ...

Belief in the pre-paradigmatic argument provides the basis for a good portion of optimism within social science. But the fact remains that today’s natural-science-modeled social sciences are no more “normal” and have no more predictive success than their seemingly less sophisticated predecessors. After more than 200 years of attempts, one could reasonably expect that there would exist at least a sign that social science has moved in the desired direction, that is, toward predictive theory. It has not. And when the social sciences are compared with relatively new natural sciences such as meteorology and biology, which also struggle with especially complicated objects of study, it can be seen that the latter exhibit slow, but relatively cumulative, progress. These relatively new natural sciences have evolved ever more complex theories which account for an increasing range of phenomena, while social science typically seeks to develop theories pertaining to one class of phenomena and then abandons these for theories which include another. The social sciences appear unable to demonstrate the kind of progress which is supposed to characterize normal science.

The difference between the natural and social sciences seems to be too constant and too comprehensive to be a historical coincidence We may thus be speaking of so fundamental a difference that the same research procedure cannot be applied in the two domains.

Dead objects, self-reflecting humans

[There is] a critical difference between natural and social sciences: the former studies physical objects while the latter studies self-reflecting humans and must therefore take account of changes in the interpretations of the objects of study. Stated in another way, in social science, the object is a subject.

Anthony Giddens ... expresses this difference as follows:

The technical language and theoretical propositions of the natural sciences are insulated from the world with which they are concerned because that world does not answer back. But social theory cannot be insulated from its “object-world,” which is a subject-world.

Two types of self-interpretations appear in what Giddens calls the “double hermeneutic.” First are the self-interpretations among those people the researchers study. According to hermeneutics ..., these self-interpretations and their relations to the context of those studied must be understood in order to understand why people act as they do. Hermeneutics is here closely connected to Max Weber’s *verstehen* [understanding], which emphasizes understanding as distinct from explanation. The second aspect of the double hermeneutic concerns the researchers’ own self-interpretations. Just as the people studied are part of a context, research itself also constitutes a context, and the researchers are a part of it. The researchers’ self-understanding and concepts do not exist in a vacuum, but must be understood in relation to this context. Context both determines and is determined by the researchers’ self-understanding.

Following the double hermeneutic, the question of what are to be counted as “relevant” facts within a given discipline – for example, political facts within political science or social facts within sociology – is determined by both the researchers’ interpretations and by the interpretations of the people whom the researchers study. In the hermeneutic–phenomenological argument, this means that the study of society can only be as stable as the self-interpretations of the individuals studied. And inasmuch as these interpretations are not constant, the study of society cannot be stable either. The natural sciences, say the practitioners of hermeneutics, do not have a corresponding problem because their objects of study are not self-interpreting entities: they do not talk back.

...

[But is there] something more fundamental in social science [that] prevents normal science (in the Kuhnian sense) from developing?

The deadly paradox of social theory

Hubert Dreyfus and Pierre Bourdieu argue that the study of individuals and society can never be “normal” in the Kuhnian sense because of the relationship between ideal scientific theory on the one hand and human activity on the other. The limitation on “normality,” ... lies ... in problems with establishing theories about the social world which parallel natural-science theories; and more specifically, for social science in problems with explaining and predicting social activity using abstract, context-independent elements. The argument is clearer than other arguments about the status of the social sciences and it has wide-ranging consequences for our understanding of what these sciences can and cannot be.

Dreyfus’s first step is to make clear what he understands by ideal “theory.” He goes

back to Socrates, whom he regards as the founder of that unique intellectual activity called theorization. Ideal theory is viewed by Dreyfus as having six basic characteristics that can never be fully realized, but can be approached to varying degrees. Socrates introduced and argued for the first three of these when he said that a theory must be (1) explicit, (2) universal, and (3) abstract. It must be explicit because a theory is to be laid out so clearly, in such detail, and so completely that it can be understood by any reasoning being; a theory may not stand or fall on interpretation or intuition. Second, a theory must be universal in that it must apply in all places and all times. Third, a theory must be abstract in that it must not require the reference to concrete examples. Descartes and Kant supplemented Socrates' three criteria with two more. A theory must also be (4) discrete, that is, formulated only with the aid of context-independent elements, which do not refer to human interests, traditions, institutions, etc. And it must be (5) systematic; that is, it must constitute a whole, in which context-independent elements (properties, factors) are related to each other by rules or laws.

Finally, modern natural science has added further a criterion of ideal theory: that it must be (6) complete and predictive. The way a theory accounts for the domain it covers must be comprehensive in the sense that it specifies the range of variation in the elements, which affect the domain, and the theory must specify their effects. This makes possible precise predictions. Today, it is especially this last criterion which is the hallmark of [natural] sciences. We will see that even disciplines like biology, which ... depend on context-dependent theory, have ways of approaching the ideal of prediction that do not appear available to social science disciplines.

The six criteria characterize an ideal type of scientific theory. The argument that follows is not dependent on scientists – natural or social – ever really succeeding in constructing ideal theory. The argument also does not ignore the fact that context-dependence is known, not only in social science, but in natural science, too, for example in evolutionary biology. ...The argument only requires that the theories, which approach this ideal, do not refer to shared basic interpretations, metaphors, examples, etc.; i.e., that they are context-independent and predictive. ... [Even] though prediction requires special preconditions and is relatively rare even in parts of the natural sciences, prediction is the criterion which most clearly helps us distinguish between natural and social sciences.

Just as ideal natural science explains and predicts in terms of context-independent elements which can be abstracted from the everyday world – mass and position in physics, for example – the study of society, insofar as it attempts to follow natural science, must also abstract such elements from the context-dependent activities of human beings in order to subsequently explain and predict those activities in terms of formal relations (rules or laws) between the abstracted elements. ...

Dreyfus and Bourdieu argue that this approach, which has been successful in many parts of the natural sciences, cannot succeed in the study of society. The reason, says Dreyfus, has to do with the central importance of context in human social life:

Insofar as the would-be sciences [social sciences modeled upon the natural sciences] follow the ideal of physical theory, they must predict and explain everyday activities, using decontextualized features. But since the context in which human beings pick out the everyday objects and events whose regularities theory attempts to predict is left out in the decontextualization necessary for theory, what human beings pick out as objects and events

need not coincide with those elements over which the theory ranges. Therefore predictions, though often correct, will not be reliable. Indeed, these predictions will work only as long as the elements picked out and related by theory happen to coincide with what the human beings falling under the theory pick out and relate in their everyday activities.

Dreyfus's point is that the phenomena, which a theory selects as relevant via the theory's logic, are not necessarily identical with those phenomena selected as relevant by those people covered by the theory. Dreyfus states further, that this is the case because the context is excluded, the very context in which human beings select those everyday phenomena, whose regularities the theory attempts to explain and predict. ...

If Dreyfus is right he has identified a fundamental paradox for social and political science: a social science theory of the kind which imitates the natural sciences, that is, a theory which makes possible explanation and prediction, requires that the concrete context of everyday human activity be excluded, but this very exclusion of context makes explanation and prediction impossible.

[Excerpted and modified from Bent Flyvbjerg's *Making Social Science Matter: Why social inquiry fails and how it can succeed again* (Cambridge: Cambridge University Press, 2001.)]