

Rival Philosophies of Science and the Debates over the Constitution of Society

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Abstract

This essay will introduce, compare, and critique what I take as three rival philosophies of science, namely positivism, hermeneutics, and critical realism. I shall also examine debates about the constitution of society in terms of methodological individualism, methodological collectivism, and agency/structure. I will then take up a discussion of my perspective on the work of Morteza Ardebili, inasmuch as he has developed what I consider to be a viable method for evaluating these three competing philosophies. His heuristic is called the Structure of Scientific Practice (SSP). (peer-reviewed)

Introduction

Let me begin with some preliminary remarks on philosophy, which is often held to be composed essentially of ontological questions and epistemological questions. *Ontology* involves a theory of being, but *being* may be defined in various ways. The positivist ontology classically asserts that *to be is to be perceived* (“esse est percipi” Berkeley, Hume). The hermeneutic ontology contends that *to be is to be meaningful*. The critical realist ontology holds that *to be is to be able to do*, i.e. the real brings about material consequences. *Epistemology* concerns the nature and grounds of knowledge, such that what we claim to be the case is indeed the case. It deals with understanding the processes by which we can gain a certain degree of confidence about statements made about reality. The positivist epistemology is concerned with facts and how precisely they may validate or invalidate hypotheses about what is.¹ Hermeneutic epistemology offers a coherence theory of truth; if an interpretation is correct, it coheres with the larger universe of meaning. The critical realist epistemology is still debated, but most often it is considered a pragmatic theory of truth, or correspondence theory of truth, while some argue for a convergence of correspondence, coherence, and pragmatics.

¹ In this essay the positivist paradigm will refer to the logical empiricism, which dominated the philosophy of science from 1932-1962. The most influential authors of this period were Popper, Hempel, Oppenheim, Lakatos, and Hayek in social science.

An awareness of the theory-ladenness of experience is taken as one of the key elements of a post-positivist critique of the (positivist) notion that we all observe objects or events in the same way. There are, however, many instances where individuals look consciously at things from different perspectives. Post-positivism argues that how we interpret what we see is theoretically mediated. In fact, humans fail to have immediate access to understand, interpret, and explain what we see. Our understanding is always mediated by a set of concepts and theories. The post-positivist assertions of the theory-ladenness of observation, and more broadly communities of scientists within each paradigm with their own conception of reality, has led to a dangerous internal relativism. The best example of this surfaces with a few contrarian scientists who resist the anthropomorphic explanation for climate change. If knowledge generated in each paradigm is based on different criteria, and these paradigms are incommensurate, how can it be possible that everyone's knowledge is valid only for its own community of scholars?²

Hermeneutical knowledge is commonly linked with social science since it is not based on a closed system or independent reality as is the more analytic "pure science" positivist paradigm. It occurs in an open system and its interpretative product is based upon previous interpretations. The hermeneutic circle takes into account prejudgments that comprise personal experiences, language, and ideological conceptions.³ Charles Taylor asserts that we can inter-subjectively communicate and share a universe of meaning; the empirical surface may be thin, but hermeneutics is thick and descriptive.⁴ The main shortcoming of hermeneutics is that in order for something to be understood, reality is reduced to our meaning, and our language. Agreement on what something is does not mean it is actually what we think it is, especially if opposing groups have opposing understandings of the same social phenomenon. Its most important ontological mistake is that it does not give weight to actual events in reducing them to meaning.

The hermeneutic paradigm is idealist philosophically since society

² Margaret Archer, Roy Bhaskar, Alan Collier, Tony Lawson, and Alan Norrie (eds.), *Critical Realism: Essential Readings* (New York: Routledge, 1998) p. x.

³ Berth Danermark, Mats Ekström, Liselotte Jakobsen, and Jan Ch. Karlsson, *Explaining Society: Critical Realism in the Social Sciences* (New York: Routledge, 2002) pp. 159, 160.

⁴ Charles Taylor, "Interpretation and the Sciences of Man," *Philosophy and the Human Sciences: Philosophical Papers 2*. (New York: Cambridge University Press, 1985) p. 35.

and reality are created in the mind. In trying to come up with correct interpretations, the hermeneutic philosophy loses its ability to explain transformation of meaning over time. Being is reduced to meaning without addressing the conditions for changes in meaning, such as questions of power and structure. For example, if within a certain cultural norm one acquires a quality regarded as legitimate, then outside the paradigmatic interpretation of that norm one would be discredited. Finally, hermeneutics emphasizes coherence between meaning and interpretation, but theoretically considers only the realm of meaningful events as reality. Hermeneutic social theory is anthropocentric, based upon understanding relations between individuals in a social context. It offers coherence between meaning and reality, but also is open to the charge of epistemological and ontological relativism. Relativism raises serious questions about the legitimacy of science.

British philosopher, Roy Bhaskar, posited a view of science as primarily a concrete, practical, social activity aimed at influencing, transforming, improving, modifying, or manipulating the reality of which it is a part.⁵ His critical realism challenges relativism and supports a qualified thesis of naturalism where social structures, unlike natural structures, are activity dependent, concept dependent, and geo-historically specific.⁶ The philosophical ontology of critical realism finds that something is real if it can bring about material consequences. Its epistemology favors the production of knowledge structurally homologous to production of things requiring raw materials, means of production, and human labor.

Bhaskar may be regarded as the most influential scientist to provide critical realism with a coherent philosophical language. He inverts Kant's transcendental idealism, where certain categories are innate as to the way humans understand the world, and posits a transcendental *realism*, which implies the basic preconditions for our knowledge of reality are to be found in this reality independent of our seeking knowledge.⁷ In other words, reality exists independently of us and can be different from our conception of it. With critical realism, Bhaskar posits a retroductive argument: in order for something to be visibly real it must have parallel invisible ontological characteristics. The core of critical realism consists of switching from epistemology to ontology within philosophy, and within ontology, a switch from events to generative mechanisms.⁸

⁵ Danermark et. al., op. cit., p. 24

⁶ William Outhwaite, "Realism in Social Science" in *Critical Realism: Essential Readings*, op. cit., p. 288

⁷ Danermark, et. al., op. cit. p. 5.

⁸ Ibid.

Specific cases favoring the emancipatory capabilities of critical realism were developed by Margaret Archer, who writes:

Social reality is unlike any other because of its human constitution. It is different from natural reality whose defining feature is self-subsistence: for its existence does not depend upon us, a fact which is not compromised by our human ability to intervene in the world of nature and change it. . . The nascent “social science” had to confront this entity, society, and deal conceptually with its three unique characteristics.⁹

The unique characteristics of society, as stated in the above paragraph by Margaret Archer, take the analysis a step further and get to the heart of the problem in sociology: understanding the relationship between the individual and society. As human agents we are free and constrained at the same time by society as a structure.¹⁰ Our adequacy to theorize about society depends on our ability to recognize and reconcile these two aspects. How we see a social phenomenon not only determines what we think about the event, but also the way we theorize and develop models for elucidating knowledge. The lens selected to view the world determines how we reproduce, elaborate, or transfer ideas to the next generation. In this way scholars all have a bias that they bring to the classroom and to their research.

Critical realism, as the newest form of scientific method, is being used by scholars in the philosophy of social science, ethics, politics, film, literature, and the history of philosophy. It should not be understood as having claims about the nature of *absolute* reality, but rather it is critical of the nature of *actual* reality and of our understanding of social and natural reality. Critical realism holds promise because unlike natural science, social science is value-charged, thus it may challenge material interest groups, and is suspect in its ability to bring useful knowledge to the world.¹¹ It has been said the most powerful reason for utilizing critical realism is to acquire a framework for rational discussion of ontological questions.¹² The critical realist philosophy abandons the observation and the covering law model of explanation and replaces it with a complex network of theory and observational statements representing generative mechanisms.¹³ Critical realists attempt to reconcile ontological realism,

⁹ Margaret S. Archer, *Realist Social Theory: The Morphogenetic Approach* (New York: Cambridge University Press, 1995) p. 1.

¹⁰ *Ibid.*, p. 2

¹¹ Danermark, et. al., op. cit., p. 38

¹² Outhwaite, op. cit., p. 294.

¹³ *Ibid.*, p. 292.

epistemology, relativism and judgmental rationality.¹⁴

Bhaskar's transcendental realist philosophy generated the following three stratified domains: the *empirical*, with experiential events, direct data, and facts; the *actual*, where events happen regardless of experience; and the *real*, where structures with causal powers and liabilities produce mechanisms that explain events in the actual world.¹⁵ Social phenomena emerge from the deeply underlying real structures, become actual, and then empirical. Positivist and hermeneutical understandings of these social phenomena work in the opposite direction creating an epistemic fallacy. Critical realism looks for deep dimensions where generative mechanisms are to be found.

Natural or social science for the critical realist has two dimensions, which are referred to as the central paradox of science: the *intransitive* and *transitive* dimensions.¹⁶ The intransitive dimension is the underlying structure of reality, which can be used to explain something of known structure. This operates independently of our knowledge, independently of any person's perceptions. The structures and arrangements of society constitute the intransitive objects of social science.¹⁷ The transitive dimension involves our perception of reality, is epistemological, open to socio-historical change, consists of explanatory theory, scientific theory, conditions of conceptualization, ideas, notions of concepts of other interpretations, and is activity dependent.¹⁸

Debates on the Constitution of Society

If the nature of the constitution of society has something to do with beliefs, it is also necessary to comprehend the social and material preconditions for generating knowledge. The constitution of society is generally conceptualized in three distinct ways. The first consists of seeing society as a series of independent atomistic events with no necessary relations.¹⁹ This conception of social reality in the West reflects the dominant ideology of rugged individualism and is in close alliance with the positivist paradigm. The second view is also framed by the positivist

¹⁴ Danermark, et. al., op.cit., p. 10

¹⁵ Ibid., p. 20.

¹⁶ Ibid., pp. 22, 23.

¹⁷ Ibid., p. 35.

¹⁸ Ibid., p. 35, 36.

¹⁹ Watkins, J. W. N., "Ideal Types and Historical Explanation" in John O'Neil ed., *Modes of Individualism and Collectivism* (London: Heinemann, 1973).

paradigm: to conceptualize society as a group of individuals that share a common culture.²⁰ Third, society can be conceived as an ensemble of relations where there is a structure with individual agents obligated to interact with a level of pre-determined behavior.²¹ Margaret Archer's structure/agency model offers the latest most detailed expression of this concept within the critical realist paradigm, as I shall elaborate below.

Today, positivism is the dominant paradigm for studying sociology, the physical and biological sciences, political science, and economics. While positivism works effectively to accumulate facts linearly, when it eliminates "the metaphysical," it sacrifices the ability to know what triggers an event, and what the world must be like in order for that event to have occurred. This is not to necessarily presuppose theological or religious causation, but, in contrast to Humean empiricism, which denies the causal nexus, legitimate scientific knowing *does* necessitate locating causal responsibility for an event: causal mechanisms must be theorized.

The positivist paradigm fails at internal consistency when positivist scientific theory asserts there are no necessary relations between objects or events. When its atomistic ontology does not look at real, yet intangible ("metaphysical"), components, it reduces the reality of the positivist paradigm to the empirical. If reality is constituted by atomistic events without relations among them, then relations are exclusively external and contingent as opposed to internal and interconnected. In other words, there are no necessary internal relations, only external contingencies.

Methodological individualism was developed out of the Humean positivist philosophical ontology. This is the notion that theories must be constructed and analyzed in terms of individuals, "of their attitudes, expectations, relations, etc."²² These actions must be explained by reference to atomistic intentional states or personal attitudes that motivate individual actors. Methodological individualism holds that if one wants to generate knowledge about any phenomenon in society one must understand society as comprised of persons principally acting as individuals. Watkins adds critically that the positivist conception of social reality erroneously holds that "no social tendency exists which could not be altered if the individuals concerned both wanted to alter it and possessed

²⁰ Taylor, op. cit.

²¹ Archer, op. cit., p. 1.

²² Popper, Karl, R. *The Poverty of Historicism* (London: Routledge, 1961) p. 72.

the appropriate information.”²³

Maurice Mandelbaum effectively challenged methodological individualism with his advocacy of methodological collectivism in the late 1950s. His contention was that “the actual behavior of specific individuals towards one another is unintelligible unless one views their behavior in terms of their status and roles, and the concepts of status and roles are devoid of meaning unless one interprets them in terms of organization of the society to which the individuals belong.”²⁴ He provided a now classic example of the irreducibility of social action to methodological individualism by describing the context of actual behavior of someone making a withdrawal at the bank and this interaction with the teller. The only way this behavior can be explained is for the rudiments of banking to be understood using concepts that refer to aspects of societal institutions. Mendelbaum posits how parts of society are not individual human beings; rather they are specific institutions and other forms of societal organization.²⁵ He concludes that “We can do no better than to hold to the view that there are societal facts which exercise external constraints over individuals no less than there are facts concerning individual volition which often comes into conflict with these constraints.”²⁶ From Mendelbaum it is clear that methodological individualism is not a valid theory of the constitution of society.

Margaret Archer reminds us that it is social reality that determines how its explanation is approached. Social ontology serves as a regulator concerning the explanatory methodology because it conceptualizes social reality in a certain way, thus setting the identification of what there is to explain and ruling out explanation about entities or properties that are deemed non-existent.²⁷ Archer posits that empiricism causes problems for methodological individualism and methodological collectivism because of its ties to Humeian notions that are averse to causality, and the failure of supporting scholars to revise these two original conceptions of reality. She concludes that individuals do not restrict themselves to sense-data because they conceptualize the world in terms of group properties like elections, interest rates, theories, and beliefs which are not simply empirical.²⁸

Archer contends that facts about individuals are not any easier to

²³ Ibid., p. 169.

²⁴ Maurice Mandelbaum, “Societal Facts,” *British Journal of Philosophy*, 1957, p. 224

²⁵ Ibid., p. 231.

²⁶ Ibid., p. 234

²⁷ Archer, op.cit., p. 17.

²⁸ Ibid., p. 29.

understand than is social organization. The commitment to social atomism, where important things about people are identified independently of social context, creates a descriptive and explanatory problem by precluding *a priori* the possibility of human disposition being the dependent variable in historic explanation.²⁹ Archer characterizes methodological individualism as an attempt to understand the constitution of society as an aggregate of individuals whose actions can only be explained by a process of disaggregation and reduction.³⁰ Archer emphasizes that social structure is not passive; it is fully capable of conditioning individuals. Archer also criticizes methodological collectivism as denying the role individual human beings have in making up society. In other words, a conflation of structure and agent takes place, which poses severe problems methodologically, since it does not consider it possible to distinguish independently operating individuals possessing autonomous powers.³¹

In the 1980s it was Anthony Giddens who introduced the theory of structuration in *The Constitution of Society*. This was intended to unify methodological individualism and methodological collectivism. Structuration theory is based on a reciprocal interrelationship where structures shape people's practices and those practices in turn constitute and reproduce structures.³² Giddens thus worked with a totally different concept of structure as rules and resources became recursively implicated in social reproduction. That is, the activities of humans reproduce the conditions that make the activities possible. Giddens ultimately concedes that if social systems do not have structure, they nonetheless exhibit structural properties or principles. Archer criticizes Giddens's use of structure and agency as a type of centralized conflation; she terms it *elisionism*, where the duality of individual and society is replaced with a mutualistic societal foundation.³³

Archer proposes a realist social theory in order to move out of this conflation and replaces it with a stratified social reality in which structure, culture and agency all possess emergent social properties and develop relational powers generated out of contingent combinations.³⁴ Her social realism is based upon the guiding methodological principle according to

²⁹ Ibid., p. 35.

³⁰ Ibid., p. 4.

³¹ Danermark, *op. cit.*, p. 179.

³² William H. Sewell, "A Theory of Structure: Duality, Agency, and Transformation," *American Journal of Sociology* 98; 1: 1-29, 1992. p. 4.

³³ Margaret S. Archer, *Realist Social Theory: The Morphogenetic Approach*. New York: Cambridge University Press, 1995. p. 60

³⁴ Ibid., p. 193

which the properties and powers of agents causally intertwine with structure.³⁵ Crucial emphasis is placed on whether the interplay is constraining or enabling between strata in order to develop causal powers. Archer's social theory transcends Watkins and Mandelbaum, finds much support in Bhaskar, and furnishes internal consistency within ontology, theory, and new methodology. Although still open to debate, Archer arrives at a three-stage epistemology using correspondence, coherence, and pragmatism. That is, knowledge must cohere and correspond with an already existing body of knowledge of the intransitive realm.

The Structure of Scientific Practice

If the nature of science changes when we change paradigms, then we cannot consider the history of science, its continuity or discontinuity. If the nature of science does not change when we change paradigms, then we must ask, "What is science?" or to put another way, "What is scientific practice?" In order to better understand the constitution of society, and how it is important for social theorizing, Morteza Ardebili suggests we consider his account of the Structure of Scientific Practice (SSP) as an analytical tool. Ardebili argues that "while it may be a peaceful coexistence, where people agree to disagree, the specter of relativism is clear." Utilizing the SSP offers a way out of a relativist indictment of science and alleviates the confusion that has developed in the wake of so-called Kuhnian relativism.

For Ardebili, the argument is not to negate the ability of the three paradigms to be scientific, but to raise the question: what are the conditions of possibility and intelligibility for the production of knowledge? Two necessary dimensions of science are firstly the practical or actual, and secondly the theoretical or conceptual. It is the theoretical dimension that makes science intelligible.

Ardebili's critical contribution, the SSP, consists of a philosophical strategy composed of six layered categories of analysis: at the uppermost layer, empirical observation, methodology, and theoretical practice; below them on the next layer, epistemology and social ontology; and at the base layer, philosophical ontology. It is the philosophical ontology, or conception of the real, that constitutes our ultimate theoretical level. Yet the six categories of scientific practice examine the preconditions for science in any paradigm. The conceptual categories are highly interrelated, stable, and inherent in all scientific conceptions. Their substantive content determines the intelligibility of science. As science is grounded in social reality, social ontology determines the object of study, and with

³⁵ Ibid., p. 15

epistemology guides investigational practice. Combining the object of study with scientific theories determines the methodology, type of data, and type of instruments used. SSP offers an internal critique to discern inconsistencies in any paradigm and thereby discover which paradigm has the most adequate philosophical ontology.

Ardebili contends that all three paradigms, positivism, hermeneutics, and critical realism are important in generating scientific knowledge and point to the necessary conditions of intelligibility for science. However, the SSP reveals that the positivist paradigm has a core internal inconsistency by virtue of its Humeian ontology coupled with Cartesian epistemology, and cannot, therefore, be of full use in the production of knowledge about social reality. Hermeneutics transcends some of the problems of positivism and leads to new ways of thinking about the realm of meanings, with its thick description, interpretation, culture, and linguistics. Hermeneutics, however, leads to linguistic and conceptual fallacies. If reality is reduced to our meaning of it, and society can change, then as long as our conception of it has not changed, there is supposedly no change in society. The SSP also reveals a critical realist failure to differentiate a type of methodology that unifies both social and natural science, and formulate a way to critique practical social theory.

A major criticism of critical realism is that it has not resolved the methodological debate for a unifying methodology in the social and natural sciences. SSP resolves this problem by differentiating a pluralistic technical methodology from a unitary naturalistic methodology. SSP presupposes that every theory of science must be able to explain its own emergence: It must be general enough to account for hermeneutics and positivism, yet specific enough to account for knowledge from religion. Thus SSP acknowledges the core of critical realism that reality is separate from our conception of it in the intransitive, adds a hermeneutic that operates in the transitive by including antecedent knowledge while concomitantly transcending the view that “to be is to be meaningful” and shifting toward “to be is to exhibit causal material consequences.” In this way the SSP’s revised critical realism sustains the hermeneutic advance over positivism, that perception is conceptually mediated. Critical realism of this sort ultimately rejects the “either-or” approach of theoretical versus empirical, or positivist versus hermeneutic, or quantitative versus qualitative, and favors the “both and” approach.

In conclusion, this discussion of rival theories of science and the debates about the constitution of social reality is fundamental to our enlightened engagement with social life. Individuals in society raise structures that confine them and also build systems of thought that deny

those structures. A revitalized pluralistic democracy, with protected dissent, can offer intelligent mediation between a society and the individual, knowledge and passion, clarity and obfuscation, hope and doubt. A democratic society depends upon the advancement of science, upon the affirmation it gives to the human ability to reason about objects outside the mind, while recognizing the social and ideological dimension of all knowledge. These rivalries and debates have arisen because human beings are driven by real generative mechanisms to chart their lives and to know.