Epistemological and Ontological Priors

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Within contemporary epistemology, knowledge is defined as an "intersubjective product constructed within communal practices of acknowledgment, correction, and critique" (Code 1991, 224). This definition has the virtue of emphasizing that knowledge is a human product, generated by fallible inquirers through processes of interrogation and contestation that involve many people over long periods of time. The reference to "practices of acknowledgment" suggests plurality: there are multiple forms of knowledge (e.g., perception, memory, intuition, introspection, recollection, recognition, reflection, conceptualization, corroboration, contemplation), which cannot be reduced to a singular kind. As human conventions, practices have histories; they change over time. Practices also have standards internal to them that provide criteria for assessing quality. The criteria for judging recognition (of a form of government, a pattern of discrimination, a trajectory of development) will differ from the criteria for assessing conceptualization (adequacy of framing, theorization, representation, demarcation of boundaries). Assessing the validity of knowledge claims, then, requires attention to specific ways of knowing that are situated within particular social, cultural, and historical practices, which afford determinate standards of evaluation.

The discipline of political science encompasses multiple research communities, which have grown out of and rely upon different epistemological and ontological presuppositions. Recent debates about transparency raise important questions about which of these research communities will be accredited within the discipline, whose values, norms, and methods of knowledge production will gain ascendency and whose will be marginalized. Although the language of "transparency" makes it appear that these debates are apolitical, simply elaborating standards that all political scientists share, the intensity and content of recent contestations about DA-RT, JETS, and QTD attest to the profoundly political nature of these methodological discussions.

In this report, we trace the epistemological and ontological assumptions that have shaped diverse research communities within the discipline, situating "transparency" in relation to classical (Aristotelian), modern (Baconian) and twentieth-century (positivist, critical rationalist, and postpositivist) versions of empiricism. We then go on to discuss how recent discussions of transparency accredit certain empirical approaches by collapsing the scope of empirical investigation, while also focusing on a truncated model of the research process.

1.1 Early Versions of Empiricism

Although classical conceptions of empiricism start from the premise that the senses are the primary source of knowledge, they did not embrace a notion of transparency. On the contrary, they devoted great attention to detailing the manifold obstructions that curtail accurate perception of the world. Although Aristotle mapped the process of induction— repeated observation of particular cases in order to

arrive at a generalization—he insisted that individuals must be trained to observe the world so as not to be misled by transitory appearances. By asking the right questions and making careful distinctions, empirical observation could generate accurate knowledge, but that knowledge was neither simple nor direct. Indeed, trained observers could produce very different kinds of explanation of observed phenomena. Where "genetic explanation" is oriented toward the past, tracing the origin of a phenomenon, identifying its "genesis;" "teleological" explanation is future-oriented, seeking to explain the goal or end toward which something is developing. Where a "material" explanation provides an account of the "matter" or "substances" of which something is made; a formal explanation provides an account of the various stages of actualization over the course of a developmental process, attending to particular forms assumed by a developing organism; and an "efficient" explanation provides an account of the mechanisms that cause the transformations from one stage to the next, locating the "engine" of change. Because each of these forms of explanation focuses on a different level of analysis, the accounts they generate are markedly different. The differences in these accounts do not imply, however, subjectivity in perception. On the contrary, each form of explanation generates objective information about a different aspect of existence. According to Aristotle, a comprehensive account encompassing all these modes of explanation is required to fully understand a particular organism.

Through his studies of diverse subjects, Aristotle came to insist that different kinds of phenomena admit of different kinds of knowledge. Theoretical knowledge, which involves the contemplation of things as they are with no attempt to change them, is possible in the domains of physics, mathematics, and metaphysics. In contrast to theoretical knowledge's recognition and acceptance of things as they are, practical knowledge involves the use of reason to guide choices in order to live well. Practical knowledge used to enable individuals to attain happiness is, according to Aristotle, the science of ethics. Practical knowledge of what is necessary to foster the good of communities is the science of politics. Aristotle also identified a third kind of knowledge, productive knowledge, a kind of "know how" essential to making things. The spheres of making and the kinds of "things" that could be made in Aristotle's view are far more expansive than are typically associated with technical knowledge in contemporary understandings of production and construction. Techne, the term that refers to "making" in classical Greek, referred to the knowledge that artisans used to produce goods essential to survival, that poets and playwrights used to produce pathos, bathos, and catharsis in their audiences, and that rhetoricians used to persuade listeners to accept their arguments. Thus, Aristotle's conception of productive knowledge is relevant not only to forms of knowledge that support industrial production and information technology. It also informs accounts of the manifold practices through which categories of difference such as race, class, and gender are produced and maintained, and the creative and symbolic production of cultural meanings. On Aristotle's view, the criterion for truth in the realm of practical and productive knowledge is efficacy. The proof of the truth of practical reason's ethical arguments is that they do indeed produce individual happiness. Similarly, political knowledge succeeds in promoting the well-being of communities and states. The proof of techne's "know how" is that it succeeds in producing precisely the products, emotions, and convictions that it sets out to produce in particular instances. Practical and productive knowledge succeed because they get the world right, inaccurate or mistaken views fail because they do not.

Bacon, the "father of modern science," declared all knowledge his province as he set out to accredit certain modes of inductive inquiry, which he envisioned as a way to overcome the undue reverence for the past. Yet he acknowledged that for individuals to be able to "open their eyes and minds to the world around them," significant obstacles would have to be overcome. In New Organon or True Directions Concerning the Interpretation of Nature (1620) Bacon enumerated multiple sources of error that impeded the acquisition and progress of empirical knowledge and devised tools to identify, eliminate, or control sources of potential deception and misunderstanding. Bacon called these various sources of error, "idols" from the Greek, eidolon—"images" or "phantoms" that cloud the mind and impair an objective apprehension of external reality. He identified four distinct idols, which must be purged to

prepare the way for empirical inquiry. Although Bacon's references to "opening eyes" and "clearing the mind" might suggest parallels with contemporary notions of transparency, he did not believe that even the most scrupulous adherence to "scientific method" could eliminate all obstacles to knowledge.

"Idols of the Tribe" refer to basic operations of the human mind, which Bacon understood as fundamental "weaknesses of human nature." As such, they cannot be eliminated, although they can be controlled by adherence to "scientific method." One of the chief human weaknesses, according to Bacon, is that the human senses themselves are dull and easily deceived. In addition to sensory dullness, Bacon suggested that we tend to rely too heavily on immediate perceptions, rushing to conclusions and making premature judgments that are more likely to be wrong that right. Human observers also tend to impose more order on observed phenomena that actually exists. We think we "see" similitude when there is singularity or "perceive" regularity when there is randomness. Humans also have a profound tendency to "wishful thinking" in Bacon's view. We tend to accept, believe, and seek conclusive "proof" for what we prefer to be true. These troubling tendencies can be partially counteracted by rigorous adherence to inductive techniques, which require careful and painstaking accumulation of evidence by multiple observers who subject one another's claims to strict scrutiny.

"Idols of the Cave" involve peculiar distortions, prejudices, and erroneous beliefs that arise from an individual's upbringing within a particular family within a specific tradition and culture. Whereas the idols of the tribe pertain to all human beings, idols of the cave are social in nature yet vary from one person to another. Tied to an individual's position within a society, education, and personal history, idols of the cave could include biases linked to particular disciplinary training or theoretical orientation, a tendency to rely upon a few select "authorities" to justify one's stance, or to interpret phenomena in terms of one's own narrow specialization. To "dislodge" the idols of the cave, Bacon recommended the use of skepticism as a resource for the individual inquirer. Whatever one's mind "seizes and dwells upon with peculiar satisfaction is to be held in suspicion" (lviii) and interrogated at length. Distortions of this sort can also be partially corrected by the practice of science as a public enterprise, involving many people, who test one another's claims and subject them to rigorous empirical tests.

Bacon's third and "most troublesome" type of obstruction to the clear apprehension of the world is related to language. Bacon suggests that language has the power to distort perception because it is not the neutral tool that many believe it to be. On the contrary language can shape understanding in a variety of ways. Everyday meanings of words may exact a powerful hold on people. Some terms can be markedly misleading because they have so many different referents that their meaning in a particular instance is always ambiguous. Bacon also pointed out that when technical meanings of terms proliferate, scholars can devote all their time and attention to fights over the meanings of words and lose sight of larger questions about processes in the world.

The final source of error identified by Bacon suggested that philosophical systems themselves can distort individual's perceptions of the world. He identified three distinctive kinds of mistake that generate flawed worldviews: casual observation and anecdotal evidence; philosophical systems based on a single key insight, which is generalized to explain phenomena of all kinds, thereby producing a pattern of distortion; potent mixtures of philosophy and theology that impede objective perception of the external world.

In delineating these obstacles to transparency, Bacon anticipated twentieth-century discussions of the theoretical constitution of facticity, the argument that theoretical presuppositions structure every step of the research process, from the most elementary perceptions through the accreditation of particular forms of evidence and explanation. In contrast to these more recent debates, however, Bacon argued that these idols could be controlled. Induction, the systematic observation of particulars as a means to arrive at defensible generalizations, coupled with experimental methods designed to test the validity of inductive

generalizations, could generate accurate knowledge of the world. Refutations of mistaken generalizations or axioms could also serve as a "ladder to the intellect" for they indicated wrong directions that should not be pursued any further. Moreover, the use of scientific knowledge to develop instruments to help humans solve problems and improve their condition also generated an important means to demarcate truth from falsity. Bacon anticipated the "pragmatic theory of truth," which links the assessment of knowledge claims to outcomes. On this view, both theories and technological innovations are true if "they work," if they enable people to achieve the objectives that they set for themselves.

In the eighteenth century, David Hume (1711-1776) launched a strenuous campaign to debunk the foundationalist pretenses of rationalism and empiricism. In his Enquiry Concerning Human Understanding (1748), Hume provided compelling demonstrations that neither deductive logic, the tool endorsed by rationalists for the preservation of truth, nor inductive logic, the instrument accredited by empiricists for the discovery of truth, could perform up to the expectations of their respective proponents. Following the demarcation of domains of knowledge developed by rationalists and empiricists, Hume accepted that there are two possible kinds of knowledge: "relations of ideas" and "matters of fact." Hume was willing to grant that deduction operates admirably in some contexts such as the system of Euclidean geometry where the "relations of ideas" are governed by logical necessity. For example, a triangle is a three-sided figure. It would be logically impossible then for any four-sided figure to be a triangle. We can have "absolute certainty" then about what a triangle is and what it is not. In cases of such "relations of ideas," tautological definitions establish the "truth" of the major premise and demarcate the properties of the geometric figure that may be deduced through syllogistic demonstrations. If rationalists restricted their claims about knowledge to the sphere of geometry or to a limited set of tautological "relations of ideas," their case for deduction would be defensible. The problem arises, according to Hume, when rationalists claim that deduction can provide absolute knowledge about the material world, a domain governed by contingency rather than logical necessity.

As a description of the material world, contingency captures the possibility that things could be other than they currently are. The sun "rises" each day, but not because it is logically required to do so. The physical forces governing the sun and the earth's movement around it could change. As a star, the sun could cease to exist. As a planet, the earth could also cease to exist. What we think we know about the sun and the earth are not a matter of tautological definition. Thus, the truth-preserving power of deductive logic, which depends on the truth of the major and minor premises in a syllogism, does not hold in cases where contingent propositions supplant tautologies in syllogistic reasoning. In the absence of tautologies, which are the key to "absolute certainty" in deductive arguments, rationalists cannot guarantee the truth of any claim they advance about the world we live in.

Hume pointed out that claims about the natural and social world rest on inductive generalizations, which are themselves prone to error in the face of contingency. In a famous discussion of the "problem of induction," Hume demonstrated that it is not possible to have sufficient empirical evidence to prove conclusively any inductive generalization. The quest for absolute certainty grounded on observation of particular cases is foiled in a variety of ways. To achieve the status of a universal truth, an inductive generalization would have to hold for all past, present, and future cases. No matter how much inductive evidence we have to support a generalization, however, it will never be enough to cover all past and future instances. Moreover, in a world of contingency, things can and do change. Thus, there is no reason to believe that the future will be the same as the present or past. Any number of factors could cause a generalization based on past evidence to fail to hold in the future. Contrary to the optimism of Aristotle and Bacon, Hume suggested that the impossibility of gathering universal evidence as well as contingency undermine induction as an absolute ground for truth claims.

Hume did not rest content with a demonstration of the limitations of deductive and inductive logic. He also developed an argument that the human mind operated according to principles at great

remove from what is commonly considered "reason." Hume agreed with empiricists that thoughts or ideas enter the mind through primary sensory impressions. He suggested, however, that the mind actively organizes these perceptions according to three principles: resemblance, contiguity, and causation. Breaking with a long line of thinkers who characterized the mind as a passive medium that simply receives impressions from the external world, Hume argued that the mind actively imposes order on our perceptions, thereby structuring our understanding of the world. Indeed, he suggests that these principles support inferences that enable our minds to move beyond immediate experience and memory. Indeed, Hume notes that causal inferences, in particular, expand our knowledge of matters of fact beyond our sensory impressions and our memories of them.

Breaking the idea of cause and effect into its component parts, Hume suggested that a causal relationship typically implies priority in time (the cause precedes the effect), contiguity (the cause triggers the effect by temporal and spatial touching as when pool balls move when physically hit by a pool cue), and necessary connection (the effect necessarily follows from the cause; its appearance is not arbitrary or coincidental). Following empiricist claims that knowledge of matters of fact derive from sensory observation, Hume tried to locate the primary sensory impressions from which the constitutive ideas of cause and effect arise. He pointed out that priority in time and contiguity are empirically observable, but necessary connection is not. "Constant conjunction" or "correlation" in the language of statistics—two things occurring together—is all that is empirically observable in a putative causal observation. Correlations, however, are notoriously fallible.

According to Hume it is a "habit of the mind" or a "mental custom" that imposes "necessity" upon constant conjunction in order to "render our experience useful to us." Rather than allowing us to be paralyzed by skepticism or by a lack of adequate evidence, our minds lead us to believe there is a causal connection when we observe constant conjunction. Any conflation of correlation with causation is based on a presumption that past experience is a reliable guide to the future because the future will be like the past, a presumption belied by contingency. Thus, Hume points out that our convictions about the reliability of our causal inferences rest upon mental custom, not rational argument. In a world of contingency there is no reason that the future should replicate the past. Custom not reason makes us expect a future that conforms to our expectations. A simple mental habit shores up our confidence in our fallible perceptions of constant conjunction, a mental habit with certain affinities to "wishful thinking."

1.2 Twentieth-Century Debates in the Philosophy of Science

Positivism

The term, positivism, was first coined by the French sociologist Auguste Comte, who suggested that scientific understanding operates in the realm of the "positive," which denotes "real" or "actual" existence. Comte suggested that scientists must eschew the metaphysical and theological realms and restrict their investigations to observable facts and the relations that hold among observed phenomena. Within this finite sphere of the empirically observable, scientific inquiry could discover the "laws" governing empirical events. In the early twentieth century, philosophers of science known as the "Vienna Circle" developed "logical positivism," which further restricted the possibilities for valid knowledge by elaborating the "verification criterion of meaning." Focusing on how to establish the truth of specific statements about the empirical world, the verification criterion stipulated that a contingent proposition is meaningful, if and only if it can be empirically verified, that is, if there is an empirical method for deciding if the proposition is true or false.

Within the natural sciences and the social sciences, positivist commitments generated a number of methodological techniques designed to ensure the truth—not of propositions—but of scientific

investigations. Chief among these is the dichotomous division of the world into the realms of the "empirical" and the "non-empirical." The empirical realm, comprising all that can be corroborated by the senses, is circumscribed as the legitimate sphere of scientific investigation. As a residual category, the non-empirical encompasses everything else–religion, philosophy, ethics, aesthetics and evaluative discourse in general, as well as myth, dogma and superstition–and is relegated beyond the sphere of science. Within this frame of reference, science, operating within the realm of the observable, restricting its focus to descriptions, explanations and predictions that are intersubjectively testable, can achieve objective knowledge. The specific techniques requisite to the achievement of objective knowledge have been variously defined by positivism and critical rationalism.

On the grounds that only those knowledge claims founded directly upon observable experience can be genuine, positivists deployed the "verification criterion of meaning" to differentiate not only between science and non-science, but between science and nonsense (Joergenson 1951; Kraft 1952; Ayer 1959). In the positivist view, any statement that could not be verified by reference to experience constituted nonsense: it was literally meaningless. The implications of the verification criterion for a model of science were manifold. All knowledge was believed to be dependent upon observation, thus any claims, whether theological, metaphysical, philosophical, ethical, normative or aesthetic, which were not rooted in empirical observation were rejected as meaningless. The sphere of science was thereby narrowly circumscribed and scientific knowledge was accredited as the only valid knowledge. In addition, induction, a method of knowledge acquisition grounded upon observation of particulars as the foundation for empirical generalizations, was taken to provide the essential logic of science.

The task of science was understood to comprise the inductive discovery of regularities existing in the external world. Scientific research sought to organize in economical fashion those regularities that experience presents in order to facilitate explanation and prediction. To promote this objective, positivists endorsed and employed a technical vocabulary, clearly differentiating facts (empirically verifiable propositions) and hypotheses (empirically verifiable propositions asserting the existence of relationships among observed phenomena) from laws (empirically confirmed propositions asserting an invariable sequence or association among observed phenomena) and theories (interrelated systems of laws possessing explanatory power). Moreover, the positivist logic of scientific inquiry dictated a specific sequence of activities as definitive of "the scientific method."

According to this model, the scientific method begins with the carefully controlled, neutral observation of empirical events. Sustained observation over time would enable the regularities or patterns of relationships in observed events to be revealed and thereby provide for the formulation of hypotheses. Once formulated, hypotheses were to be subjected to systematic empirical tests. Those hypotheses which received external confirmation through this process of rigorous testing could be elevated to the status of scientific laws. Once identified, scientific laws provided the foundation for scientific explanation, which, according to the precepts of the "covering law model," consisted in demonstrating that the event(s) to be explained could have been expected, given certain initial conditions (C_1, C_2, C_3, …) and the general laws of the field (L_1, L_2, L_3, …). Within the framework of the positivist conception of science, the discovery of scientific laws also provided the foundation for prediction, which consisted in demonstrating that an event would occur given the future occurrence of certain initial conditions and the operation of the general laws of the field. Under the covering law model, then, explanation and prediction have the same logical form, only the time factor differs: explanation pertains to past events; prediction pertains to future events.

Positivists were also committed to the principle of the 'unity of science', i.e. to the belief that the logic of scientific inquiry was the same for all fields. Whether natural phenomena or social phenomena were the objects of study, the method for acquiring valid knowledge and the requirements for explanation and prediction remained the same. Once a science had progressed sufficiently to accumulate a body of scientific laws organized in a coherent system of theories, it could be said to have achieved a stage of

"maturity" that made explanation and prediction possible. Although the logic of mature science remained inductive with respect to the generation of new knowledge, the logic of scientific explanation was deductive. Under the covering law model, causal explanation, the demonstration of the necessary and sufficient conditions of an event, involved the deductive subsumption of particular observations under a general law. In addition, deduction also played a central role in efforts to explain laws and theories: the explanation of a law involved its deductive subsumption under a theory; and explanation of one theory involved its deductive subsumption under wider theories.

Critiques of Positivism

The primary postulates of positivism have been subjected to rigorous and devastating critiques (Popper 1959, 1972a, 1972b). Neither the logic of induction nor the verification criterion of meaning can accomplish positivist objectives; neither can guarantee the acquisition of truth. As Hume demonstrated the inductive method is incapable of guaranteeing the validity of scientific knowledge because of the "problem of induction." Because empirical events are contingent, i.e. because the future can always be different from the past, generalizations based upon limited observations are necessarily incomplete and, as such, highly fallible. For this reason, inductive generalizations cannot be presumed to be true. Nor can "confirmation" or "verification" of such generalizations by reference to additional cases provide proof of their universal validity. For, as Hume made clear, the notion of universal validity invokes all future, as well as all past and present, occurrences of a phenomenon; yet no matter how many confirming instances of a phenomenon can be found in the past or in the present, these can never alter the possibility that the future could be different, that the future could disprove an inductively derived empirical generalization. Thus, a demonstration of the truth of an empirical generalization must turn upon the identification of a "necessary connection" establishing a causal relation among observed phenomena.

The notion of necessary connection raises serious problems for an empirical account of science, however. If the notion of necessity invoked is logical necessity, then the empirical nature of science is jeopardized. If, on the other hand, positivism appeals to an empirical demonstration of necessity, it falls foul of the standard established by the verification criterion of meaning, for the "necessity" required as proof of any causal claim cannot be empirically observed. As Hume pointed out, empirical observation reveals "constant conjunction;" it does not and cannot reveal necessary connection. As a positivist logic of scientific inquiry, then, induction encounters two serious problems: it is incapable of providing validation for the truth of its generalizations and it is internally inconsistent, for any attempt to demonstrate the validity of a causal claim invokes a conception of necessary connection that violates the verification criterion of meaning.

The positivist conception of the scientific method also rests upon a flawed psychology of perception. In suggesting that the scientific method commences with "neutral" observation, positivists invoke a conception of "manifest truth," which attempts to reduce the problem of the validity of knowledge to an appeal to the authority of the source of that knowledge (for example, "the facts 'speak' for themselves"). The belief that the unmediated apprehension of the "given" by a passive or receptive observer is possible, however, misconstrues both the nature of perception and the nature of the world. The human mind is not passive but active; it does not merely receive an image of the given, but rather imposes order upon the external world through a process of selection, interpretation and imagination. Observation is always linguistically and culturally mediated. It involves the creative imposition of expectations, anticipations and conjectures upon external events.

Scientific observation, too, is necessarily theory-laden. It begins not from "nothing," nor from the "neutral" perception of given relations, but rather from immersion in a scientific tradition which provides frames of reference or conceptual schemes that organize reality and shape the problems for further

investigation. To grasp the role of theory in structuring scientific observation, however, requires a revised conception of "theory"—a conception altogether incompatible with notions of transparency. Contrary to the positivist notion that theory is the result of observation, the result of systematization of a series of inductive generalizations, the result of the accumulation of an interrelated set of scientific laws, theory is logically prior to the observation of any similarities or regularities in the world; indeed, theory is precisely that which makes the identification of regularities possible. Moreover, scientific theories involve risk to an extent that is altogether incompatible with the positivist view of theories as summaries of empirical generalizations. Scientific theories involve risky predictions of things that have never been seen and hence cannot be deduced logically from observation statements. Theories structure scientific observation in a manner altogether incompatible with the positivist requirement of neutral perception, and they involve unobservable propositions that violate the verification criterion of meaning: abstract theoretical entities cannot be verified by reference to empirical observation.

That theoretical propositions violate the verification criterion is not in itself damning, for the verification criterion can be impugned on a number of grounds. As a mechanism for the validation of empirical generalizations, the verification criterion fails because of the problem of induction. As a scientific principle for the demarcation of the "meaningful" from the "meaningless," the verification criterion is self-referentially destructive. In repudiating all that is not empirically verifiable as nonsense, the verification criterion repudiates itself, for it is not a statement derived from empirical observation nor is it a tautology. Rigid adherence to the verification criterion then would mandate that it be rejected as metaphysical nonsense. Thus, the positivist conflation of that which is not amenable to empirical observation with nonsense simply will not withstand scrutiny. Much (including the verification criterion itself) that cannot be empirically verified can be understood and all that can be understood is meaningful.

Critical Rationalism

As an alternative to the defective positivist conception of science, Karl Popper advanced "critical rationalism" (1972a, 1972b). On this view, scientific theories are bold conjectures that scientists impose upon the world. Drawing insights from manifold sources to solve particular problems, scientific theories involve abstract and unobservable propositions that predict what may happen as well as what may not happen. Thus, scientific theories generate predictions that are incompatible with certain possible results of observation, i.e. they "prohibit" certain occurrences by proclaiming that some things could not happen. As such, scientific theories put the world to the test and demand a reply. Precisely because scientific theories identify a range of conditions that must hold, a series of events that must occur and a set of occurrences that are in principle impossible, they can clash with observation; they are empirically testable. While no number of confirming instances could ever prove a theory to be true due to the problem of induction, one disconfirming instance is sufficient to disprove a theory. If scientific laws are construed as statements of prohibitions, forbidding the occurrence of certain empirical events, then they can be definitively refuted by the occurrence of one such event. Thus, according to Popper, "falsification" provides a mechanism by which scientists can test their conjectures against reality and learn from their mistakes. Falsification also provides the core of Popper's revised conception of the scientific method.

According to the "hypothetico-deductive model," the scientist always begins with a problem. To resolve the problem, the scientist generates a theory, a conjecture or hypothesis, which can be tested by deducing its empirical consequences and measuring them against the world. Once the logical implications of a theory have been deduced and converted into predictions concerning empirical events, the task of science is falsification. In putting theories to the test of experience, scientists seek to falsify predictions, for that alone enables them to learn from their mistakes. On this view, the rationality of science is embodied in the method of trial and error, a method which allows error to be purged through the elimination of false theories.

In mandating that all scientific theories be tested, in stipulating that the goal of science is the falsification of erroneous views, the criterion of falsifiability provides a means by which to reconcile the fallibility of human knowers with a conception of objective knowledge. The validity of scientific claims does not turn on a demand for an impossible neutrality on the part of individual scientists, on the equally impossible requirement that all prejudice, bias, pre-judgment, expectation or value be purged from the process of observation or on the implausible assumption that the truth is manifest. The adequacy of scientific theories is judged in concrete problem contexts in terms of their ability to solve problems and their ability to withstand increasingly difficult empirical tests. Those theories which withstand multiple intersubjective efforts to falsify them are "corroborated," identified as "laws" that with varying degrees of verisimilitude capture the structure of reality, and for that reason are tentatively accepted as "true." But in keeping with the critical attitude of science even the strongest corroboration for a theory is not accepted as conclusive proof. For Popperian critical rationalism posits that truth lies beyond human reach. As a regulative ideal that guides scientific activity truth may be approximated, but it can never be established by human authority. Nevertheless, error can be objectively identified. Thus, informed by a conception of truth as a "regulative ideal" and operating in accordance with the requirements of the criterion of falsifiability, science can progress by the incremental correction of errors and the gradual accretion of objective problem-solving knowledge.

Although Popper subjected many of the central tenets of logical positivism to systematic critique, his conception of "critical rationalism" shares sufficient ground with positivist approaches to the philosophy of science that it is typically considered to be a qualified modification of, rather than a comprehensive alternative to positivism (Stockman 1983). Indeed, Popper's conception of the hypothetico-deductive model has been depicted as the "orthodox" positivist conception of scientific theory (Moon 1975: 143-187). Both positivist and Popperian approaches to science share a belief in the centrality of logical deduction to scientific analysis; both conceive scientific theories to be deductively related systems of propositions; both accept a deductive account of scientific explanation; both treat explanation and prediction as equivalent concepts; and both are committed to a conception of scientific progress dependent upon the use of the hypothetico-deductive method of testing scientific claims (Stockman 1983: 76; Brown 1977: 65-75). In addition, both positivist and Popperian conceptions of science are committed to the "correspondence theory of truth" and its corollary assumption that the objectivity of science ultimately rests upon an appeal to the facts. Both are committed to the institutionalization of the fact/value dichotomy in order to establish the determinate ground of science. Both accept that once safely ensconced within the bounds of the empirical realm, science is grounded upon a sufficiently firm foundation to provide for the accumulation of knowledge, the progressive elimination of error and the gradual accretion of useful solutions to technical problems. And although Popper suggested that reason could be brought to bear upon evaluative questions, he accepted the fundamental positivist principle that, ultimately, value choices rested upon non-rational factors.

Many of the more common research strategies developed within the natural sciences and the social sciences in the twentieth century draw upon either positivist or Popperian conceptions of the scientific method. Other post-Kantian epistemic alternatives typically are neglected due to their origins in American pragmatism, Hegelian thought, Marxian dialectics, tinkering in technological laboratories, corporate marketing research, or European phenomenology. These influences are felt in constructivism and interpretivism, but they basically are ignored in the new research universities forming at this time.
The legacy of positivism is apparent in behavioralist methods that emphasize data collection, hypothesis formulation and testing, and other formal aspects of systematic empirical enterprise, as well as in approaches which stress scientific, inductive methods, statistical models and quantitative research designs. It surfaces in conceptions of explanation defined in deductive terms and in commitments to the equivalence of explanation and prediction. It emerges in claims that social science must be modeled upon the methods of the natural sciences for those alone are capable of generating valid knowledge. It is

unmistakable in the assumption that "facts" are unproblematic, that they are immediately observable or "given," and hence their apprehension requires no interpretation. It is embodied in the presumption that confirmation or verification provides a criterion of proof of the validity of empirical claims. And it is conspicuous in the repudiation of values as arbitrary preferences, irrational commitments or meaningless propositions that lie altogether beyond the realm of rational analysis.

Popper's insistence upon the centrality of problem solving and incrementalism also resonates in a variety of approaches to scientific inquiry and social analysis. Popperian assumptions surface in the recognition that observation and analysis are necessarily theory-laden, as well as in the commitment to intersubjective testing as the appropriate means by which to deflect the influence of individual bias from scientific studies. They are manifest in the substitution of testability for verifiability as the appropriate criterion for the demarcation of scientific hypotheses and in the invocation of falsification and the elimination of error as the strategy for the accumulation of knowledge. They are obvious in the critique of excessive optimism concerning the possibility of attaining "absolute truth" about the world through the deployment of inductive, quantitative techniques, in the less pretentious quest for "useful knowledge," and in the insistence that truth constitutes a regulative ideal rather than a current possession of science. They are conspicuous in arguments that the hypothetico-deductive model is appropriate for scientific research and in appeals for the development of a critical, non-dogmatic attitude among researchers.

Post-Positivist Presupposition Theories of Science

Although Popper's critical rationalism is a significant improvement over earlier positivist conceptions of science, it too suffers from a number of grave defects. The most serious challenge to critical rationalism has been raised by post-positivist presupposition theories of science (Polanyi 1958; Humphreys 1969; Suppe 1977; Brown 1977; Bernstein 1978, 1983; Hesse 1980; Longino 1990; Foucault 1994; Stockman 1983; Gunnell 1986, 1995, 1998). Presupposition theories of science concur with Popper's depiction of observation as "theory-laden." They agree that "there is more to seeing than meets the eye" (Humphreys 1969, 61) and that perception involves more than the passive reception of allegedly manifest sense-data. They suggest that perception depends upon a constellation of theoretical presuppositions that structure observation, accrediting particular stimuli as significant and specific configurations as meaningful. According to presupposition theories, observation is not only theory-laden but theory is essential to, indeed, constitutive of all human knowledge. Thus post-positivist presupposition theorists reject "instrumentalist" conceptions of theory, the view that theories are merely "tools" intentionally created to solve problems, consciously held, fully explicable, and easily abandoned when falsified. Instead they suggest that we live within theories that provide the criteria of intelligibility for the world and for ourselves, structuring our perceptions and understandings in ways that defy our conscious grasp.

Within recent work in the philosophy of science, the epistemological and ontological implications of the post-positivist understanding of theory have been the subject of extensive debate. Arguing that the theoretical constitution of human knowledge has ontological as well as epistemological implications, "anti-realists" have suggested that there is no point in asking about the nature of the world independent of our theories about it (Laudan 1990). Consequently, the truth status of theories must be bracketed. Anti-realists have insisted that theories need not be true to be good, i.e., to solve problems (van Fraassen 1980, Churchland and Hooker 1985). Metaphysical "realists," on the other hand, have emphasized that even if the only access to the world is through theories about it, a logical distinction can still be upheld between reality and how we conceive it, between truth and what we believe (Harre 1986). Hilary Putnam (1981, 1983, 1988, 1990) has advanced "pragmatic realism" as a more tenable doctrine. Putnam accepts that all concepts are theoretically constituted and culturally mediated and that the "world" does not "determine" what can be said about it. Nonetheless, it makes sense on pragmatic grounds to insist that truth and falsity

are not merely a matter of decision and that there is an external reality that constrains our conceptual choices. Following Putnam's lead, "scientific realists" have argued that scientific theories are referential in an important sense and as such can be comparatively assessed in terms of their approximations of truth (Glymour 1980, Newton-Smith 1981, Miller 1987).

While the debates among realists and anti-realists about the criteria of truth and the nature of evidence are intricate and complex, both realists and anti-realists share convictions about the defects of positivism and critical rationalism and accept the broad contours of presupposition theories of science. On this view, science, as a form of human knowledge, is dependent upon theory in multiple and complex ways. Presupposition theories of science suggest that the notions of perception, meaning, relevance, explanation, knowledge and method, central to the practice of science, are all theoretically constituted concepts. Theoretical presuppositions shape perception and determine what will be taken as a "fact;" they confer meaning on experience and control the demarcation of significant from trivial events; they afford criteria of relevance according to which facts can be organized, tests envisioned and the acceptability or unacceptability of scientific conclusions assessed; they accredit particular models of explanation and strategies of understanding; and they sustain specific methodological techniques for gathering, classifying, and analyzing data. Theoretical presuppositions set the terms of scientific debate and organize the elements of scientific activity. Moreover, they typically do so at a tacit or preconscious level and it is for this reason that they appear to hold such unquestionable authority.

The pervasive role of theoretical assumptions upon the practice of science has profound implications for notions such as empirical "reality," and the "autonomy" of facts, which posit that facts are "given," and that experience is ontologically distinct from the theoretical constructs that are advanced to explain it. The post-positivist conception of a "fact" as a theoretically constituted entity calls into question such basic assumptions. It suggests that "the noun, 'experience', the verb, 'to experience' and the adjective 'empirical' are not univocal terms that can be transferred from one system to another without change of meaning…. Experience does not come labeled as 'empirical', nor does it come self-certified as such. What we call experience depends upon assumptions hidden beyond scrutiny which define it and which in turn it supports" (Vivas 1960, 76). Recognition that "facts" can be so designated only in terms of prior theoretical presuppositions implies that any quest for an unmediated reality is necessarily futile. Any attempt to identify an "unmediated fact" must mistake the conventional for the "natural," as in cases which define "brute facts" as "social facts which are largely the product of well-understood, reliable tools, facts that are not likely to be vitiated by pitfalls…. in part [because of] the ease and certainty with which [they] can be determined and in part [because of] the incontestability of [their] conceptual base" (Murray 1983, 321). Alternatively, the attempt to conceive a "fact" that exists prior to any description of it, prior to any theoretical or conceptual mediation, must generate an empty notion of something completely unspecified and unspecifiable, a notion that will be of little use to science (Williams 1985, 138).

Recognition of the manifold ways in which perceptions of reality are theoretically mediated raises a serious challenge not only to notions of "brute data" and the "givenness" of experience, but also to the possibility of falsification as a strategy for testing theories against an independent reality. For falsification to provide an adequate test of a scientific theory, it is necessary that there be a clear distinction between the theory being tested and the evidence adduced to support or refute the theory. According to the hypothetico-deductive model, "theory-independent evidence" is essential to the very possibility of refutation, to the possibility that the world could prove a theory to be wrong. If, however, what is taken to be the "world," what is understood to be "brute data" is itself theoretically constituted (indeed, constituted by the same theory that is undergoing the test), then no conclusive disproof of a theory is likely. For the independent evidence upon which falsification depends does not exist; the available evidence is preconstituted by the same theoretical presuppositions as the scientific theory under scrutiny (Moon 1975, 146, Brown 1977, 38–48; Stockman 1983, 73–6).

Contrary to Popper's confident conviction that empirical reality could provide an ultimate court of appeal for the judgment of scientific theories and that the critical, non-dogmatic attitude of scientists would ensure that their theories were constantly being put to the test, presupposition theorists emphasize that it is always possible to "save" a theory from refutation. The existence of one disconfirming instance is not sufficient to falsify a theory because it is always possible to evade falsification on the grounds that future research will demonstrate that a counter-instance is really only an "apparent" counter-instance. Moreover, the theory-laden character of observation and the theory-constituted character of evidence provide ample grounds upon which to dispute the validity of the evidence and to challenge the design or the findings of specific experiments that claim to falsify respected theories. Furthermore, post-positivist examinations of the history of scientific practice suggest that, contrary to Popper's claim that scientists are quick to discard discredited theories, there is a great deal of evidence that neither the existence of counter-instances nor the persistence of anomalies necessarily lead to the abandonment of scientific theories. Indeed, the overwhelming evidence of scientific practice suggests that scientists cling to long-established views tenaciously, in spite of the existence of telling criticisms, persistent anomalies and unresolved problems (Ricci 1984; Harding 1986; Foucault 1994). Thus, it has been suggested that the "theory" that scientists themselves are always skeptical, non-dogmatic, critical of received views, and quick to repudiate questionable notions has itself been falsified and should be abandoned.

The problem of falsification is exacerbated by the conflation of explanation and prediction in the Popperian account of science. For the belief that a corroborated prediction constitutes proof of the validity of a scientific explanation fails to recognize that an erroneous theory can generate correct predictions (Moon 1975, 146–7; Brown 1977, 51–7). The logical distinction between prediction and explanation thus provides further support for the view that no theory can ever be conclusively falsified. The problem of induction also raises doubts about the possibility of definitive refutations. In calling attention to the possibility that the future could be different from the past and present in unforeseeable ways, the problem of induction arouses the suspicion that a theory falsified today might not "stay" falsified. The assumption of regularity, which sustains Popper's belief that a falsified theory will remain falsified permanently, is itself an inductionist presupposition, which suggests that the falsifiability principle does not constitute the escape from induction which Popper had hoped (Stockman 1983, 81–2). Thus, despite the logical asymmetry between verification and falsification, no falsification can be any stronger or more final than any corroboration (Brown 1977, 75).

Presupposition theorists acknowledge that "ideally, scientists would like to examine the structure of the world which exists independent of our knowledge–but the nature of perception and the role of presuppositions preclude direct access to it: the only access available is through theory-directed research" (Brown 1977, 108). Recognition that theoretical presuppositions organize and structure research by determining the meanings of observed events, identifying relevant data and significant problems for investigation and indicating both strategies for solving problems and methods by which to test the validity of proposed solutions, raises a serious challenge to the correspondence theory of truth. For it both denies that "autonomous facts" can serve as the ultimate arbiter of scientific theories and suggests that science is no more capable of achieving the Archimedean point or of escaping human fallibility than is any other human endeavor. Indeed, it demands acknowledgement of science as a human convention rooted in the practical judgments of a community of fallible scientists struggling to resolve theory-generated problems under specific historical conditions. It sustains an image of science that is far less heroic and far more human.

As an alternative to the correspondence theory of truth, presupposition theorists suggest a coherence theory of truth premised upon the recognition that all human knowledge depends upon theoretical presuppositions whose congruence with nature cannot be established conclusively by reason or experience. Theoretical presuppositions, rooted in living traditions, provide the conceptual frameworks through which the world is viewed; they exude a "natural attitude" that demarcates what is taken as

normal, natural, real, reasonable or sane, from what is understood as deviant, unnatural, utopian, impossible, irrational or insane. In contrast to Popper's conception of theories as conscious conjectures that can be systematically elaborated and deductively elucidated, the notion of theoretical presuppositions suggests that theories operate at the tacit level. They structure "pre-understandings" and "pre-judgments" in such a way that it is difficult to isolate and illuminate the full range of presuppositions that affect cognition at any given time (Bernstein 1983, 113–67). Moreover, any attempt to elucidate presuppositions must operate within a "hermeneutic circle." Any attempt to examine or to challenge certain assumptions or expectations must occur within the frame of reference established by the other presuppositions. Certain presuppositions must remain fixed if others are to be subjected to systematic critique. This does not imply that individuals are "prisoners" trapped within the framework of theories, expectations, past experiences and language in such a way that critical reflection becomes impossible (Bernstein 1983, 84). Critical reflection upon and abandonment of certain theoretical presuppositions is possible within the hermeneutic circle; but the goal of transparency, of the unmediated grasp of things as they are, is not. For reflective investigation, no matter how critical, can never escape the fundamental conditions of human cognition.

A coherence theory of truth accepts that the world is richer than theories devised to grasp it; it accepts that theories are underdetermined by "facts" and, consequently, that there can always be alternative and competing theoretical explanations of particular events. It does not, however, imply the relativist conclusion that all theoretical interpretations are equal. That there can be no appeal to neutral, theory-independent facts to adjudicate between competing theoretical interpretations does not mean that there is no rational way of making and warranting critical evaluative judgments concerning alternative views. Indeed, presupposition theorists have pointed out that the belief that the absence of independent evidence necessarily entails relativism is itself dependent upon a positivist commitment to the verification criterion of meaning. Only if one starts from the assumption that the sole test for the validity of a proposition lies in its measurement against the empirically "given" does it follow that, in the absence of the "given," no rational judgments can be made concerning the validity of particular claims (Bernstein 1983, 92; Brown 1977, 93–4; Stockman 1983, 79–101; Gunnell 1986, 66–8).

Once the "myth of the given" (Sellars 1963, 164) has been abandoned and once the belief that the absence of one invariant empirical test for the truth of a theory implies the absence of all criteria for evaluative judgment has been repudiated, then it is possible to recognize that there are rational grounds for assessing the merits of alternative theoretical interpretations. To comprehend the nature of such assessments it is necessary to acknowledge that although theoretical presuppositions structure the perception of events, they do not create perceptions out of nothing. Theoretical interpretations are "world-guided" (Williams 1985, 140). They involve both the pre-understanding brought to an event by an individual perceiver and the stimuli in the external (or internal) world which instigate the process of cognition. Because of this dual source of theoretical interpretations, objects can be characterized in many ways, "but it does not follow that a given object can be seen in any way at all or that all descriptions are equal" (Brown 1977, 93). The stimuli that trigger interpretation limit the class of plausible characterizations without dictating one absolute description.

Assessment of alternative theoretical interpretations involves deliberation, a rational activity which requires that imagination and judgment be deployed in the consideration of the range of evidence and arguments that can be advanced in support of various positions. The reasons offered in support of alternative views marshal evidence, organize data, apply various criteria of explanation, address multiple levels of analysis with varying degrees of abstraction and employ divergent strategies of argumentation. This range of reasons offers a rich field for deliberation and assessment. It provides an opportunity for the exercise of judgment and ensures that when scientists reject a theory, they do so because they believe they can demonstrate that the reasons offered in support of that theory are deficient. That the reasons advanced to sustain the rejection of one theory do not constitute absolute proof of the validity of an alternative theory is simply a testament to human fallibility. Admission that the cumulative weight of current

evidence and compelling argument cannot protect scientific judgments against future developments which may warrant the repudiation of those theories currently accepted is altogether consonant with the recognition of the finitude of human rationality and the contingency of empirical relations.

Presupposition theorists suggest that any account of science, which fails to accredit the rationality of the considered judgments that inform the choice between alternative scientific theories, must be committed to a defective conception of reason. Although the standards of evidence and the criteria for assessment brought to bear upon theoretical questions cannot be encapsulated in a simple rule or summarized in rigid methodological principles, deliberation involves the exercise of a range of intellectual skills. Conceptions of science that define rationality in terms of one technique, be it logical deduction, inductive inference, or empirical verification, are simply too narrow to encompass the multiple forms of rationality manifested in scientific research. The interpretive judgments that are characteristic of every phase of scientific investigations, and that culminate in the rational choice of particular scientific theories on the basis of the cumulative weight of evidence and argument, are too rich and various to be captured by the rules governing inductive or deductive logic. For this reason, the Aristotelian conception of phronesis, practical reason, manifested in the processes of interpretation and judgment, is advanced by some presupposition theorists as an alternative to logic as the paradigmatic form of scientific rationality (Brown 1977, 148–52; Bernstein 1983, 54–78).

Presupposition theorists suggest that a conception of practical reason more accurately depicts the forms of rationality exhibited in scientific research. In contrast to the restrictive view advanced by positivism that reduces the arsenal of reason to the techniques of logic and thereby rejects creativity, deliberative judgment, and evaluative assessment as varying forms of irrationality, phronesis constitutes a more expansive conception of the powers of the human intellect. Presupposition theorists suggest that a consideration of the various processes of contemplation, conceptualization, representation, remembrance, reflection, speculation, rationalization, inference, deduction and deliberation (to name but a few manifestations of human cognition) reveals that the dimensions of reason are diverse. They also argue that an adequate conception of reason must encompass these diverse cognitive practices. Because the instrumental conception of rationality advanced by positivists is clearly incapable of accounting for these various forms of reason, it must be rejected as defective. Thus, presupposition theorists suggest that science must be freed from the parochial beliefs that obscure reason's diverse manifestations and restrict its operation to the rigid adherence to a narrow set of rules. The equation of scientific rationality with formal logic must be abandoned not only because there is no reason to suppose that there must be some indubitable foundation or some ahistorical, invariant method for scientific inquiry in order to establish the rationality of scientific practices, but also because the belief that science can provide final truths cannot be sustained by the principles of formal logic, the methods of empirical inquiry, or the characteristics of fallible human cognition. Phronesis constitutes a conception of rationality that can encompass the diverse uses of reason in scientific practices, identify the manifold sources of potential error in theoretical interpretations, and illuminate the criteria of assessment and the standards of evidence and argument operative in the choice between alternative theoretical explanations of events. As a conception of scientific rationality, then, phronesis is more comprehensive and has greater explanatory power than the discredited positivist alternative

Presupposition theorists offer a revised conception of science that emphasizes the conventional nature of scientific practices and the fallible character of scientific explanations and predictions. Confronted with a world richer than any partial perception of it, scientists draw upon the resources of tradition and imagination in an effort to comprehend the world before them. The theories they devise to explain objects and events are structured by a host of presuppositions concerning meaning, relevance, experience, explanation and evaluation. Operating within the limits imposed by fallibility and contingency, scientists employ creative insights, practical reason, formal logic and an arsenal of conventional techniques and methods in their effort to approximate the truth about the world. But their approximations always operate

within the parameters set by theoretical presuppositions; their approximations always address an empirical realm that is itself theoretically constituted. The underdetermination of theory by data ensures that multiple interpretations of the same phenomena are possible.

When alternative theoretical explanations conflict, the judgment of the scientific community is brought to bear upon the competing interpretations. Exercising practical reason, the scientific community deliberates upon the evidence and arguments sustaining the alternative views. The practical judgment of the practitioners in particular fields of science is exercised in examining presuppositions, weighing evidence, replicating experiments, examining computations, investigating the applicability of innovative methods, assessing the potential of new concepts and considering the validity of particular conclusions. Through a process of deliberation and debate, a consensus emerges among researchers within a discipline concerning what will be taken as a valid theory. The choice is sustained by reasons which can be articulated and advanced as proof of the inadequacy of alternative interpretations. The method of scientific deliberation is eminently rational: it provides mechanisms for the identification of charlatans and incompetents, as well as for the recognition of more subtle errors and more sophisticated approximations of truth. But the rationality of the process cannot guarantee the eternal verity of particular conclusions. The exercise of scientific reason is fallible; the judgments of the scientific community are corrigible.

Although the arguments that have discredited positivism are well known to philosophers, they have had little impact upon contemporary research practices in the natural and social sciences, where dominant paradigms remain positivist. This is especially unfortunate because the critique of positivism has wide-ranging implications, especially concerning the current debate about transparency. The post-positivist conception of knowledge suggests that theoretical assumptions have a pervasive influence upon our understandings of the world, accrediting contentious definitions of phenomena and validating particular strategies of inquiry while invalidating others. Moreover, positivist assumptions mask the controversial character of evidence adduced and the contestability of accredited strategies of explanation. Rather than providing a faithful method for the acquisition of truth, defective positivist assumptions themselves become a source of error shielded from scrutiny.

Post-positivist conceptions of science open new areas of investigation concerning sources of error within the presuppositions of particular research practices. By illuminating the political implications of determinate modes of inquiry, postpositivist scholars have demonstrated that the politics of knowledge is a legitimate focus of analysis, for the analytic techniques developed in particular cognitive traditions have political consequences that positivist precepts render invisible. In circumscribing the subject matter appropriate to "science," restricting the activities acceptable as "empirical inquiry," establishing the norms for assessing the results of inquiry, identifying the basic principles of practice, and validating the ethos of practitioners, methodological strictures may sustain particular modes of life that entrench oppressive practices. These concerns lie at the core of objections to transparency as a regulative ideal for all political science research.

2.1. Qualitative Transparency Deliberations (QTD)

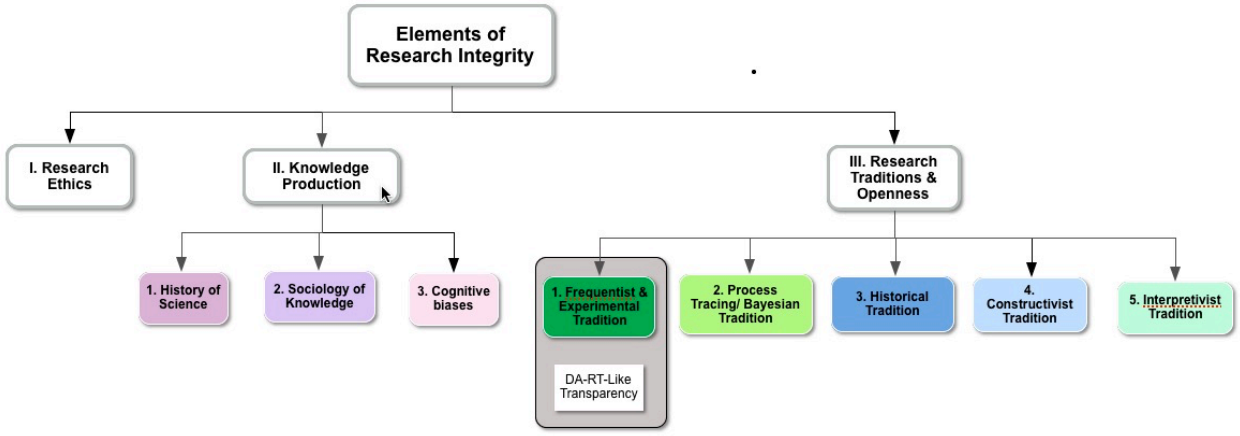
Since the behavioral revolution, dominant strands within political science have taken the natural sciences as their model of knowledge production, advocating hypothesis testing and experimentation, emphasizing replicability and aspiring to law-like generalizations, treating the physical and social worlds as knowable through similar methods of analysis, and viewing the scientific process as autonomous—unaffected by broader cultural, economic, or historical contexts in which research takes place. Characterizing this approach as the "heroic model of science," Joyce Appleby, Lynn Hunt and Margaret Jacob point out that actual research practices frequently do not live up to this textbook version and call for

scholars to articulate more realistic alternatives. (2011, 15-51) Debates concerning this heroic, textbook model of science versus more realistic alternatives provide a helpful backdrop for the conversation sparked by the DA-RT initiative (Büthe and Jacobs 2015; Isaac 2015; Schwartz-Shea and Yanow 2016). Many political scientists contend that the DA-RT guidelines and the JETS initiative reflect a contemporary version of heroic science and have drawn attention to the limitations of this approach.

The previous section revisited the historical debates between the textbook heroic version of science and its critics in terms of the broader epistemological and ontological principles. This section shifts the focus to three additional dimensions pertaining to evidence and inferences drawn from it that affect the integrity of the research process: research ethics, knowledge production, and research traditions and their openness practices. The heroic version of science and the philosophical debates it engenders pays less attention to these three elements and how they affect research integrity in addition to but also independently of epistemological first principles. The heroic version of science pays little attention to how ethical considerations in gathering and evaluating evidence affect confidence in research findings. It also ignores how the tacit research practices, which historians of science, sociologists of knowledge, and cognitive psychologists study, affect broader research integrity. Finally, it overlooks the incredibly diverse research traditions, that political scientists employ, and how their distinct openness practices increase confidence in research findings in very different ways. In short, just like epistemological principles, the research practices that assure research integrity extend well beyond those implicitly sanctioned by DA-RT. This section tries to acknowledge those practices more explicitly and shows that scholarship is an inherently collective endeavor, and, thus, is influenced by broader ethical, historical, sociological, cognitive, and methodological contexts mediating research (see Cassirer. 2000; Latour, 1993).

Figure 1 visualizes this broader research context. It borrows the term “research integrity” from Peter Hall (2016) to underscore that confidence in scholarship depends on research ethics, knowledge production, and the openness practices of different research traditions—a point made many times during the QTD deliberations. Research ethics is a fundamental concern as fraud undermines research integrity irrespective of particular epistemological assumptions. Knowledge production also affects research integrity independently of epistemological assumptions. Research openness and explicitness are two umbrella terms that were proposed in the QTD deliberations to encompass research practices—formal and informal—that various research traditions employ to assure the integrity of their research. The small gray "DA-RT-Like Transparency" box in Figure 1 underscores the relatively small number of factors covered by transparency norms from the standpoint of a more comprehensive conception of research integrity.

Figure 1: Elements of Research Integrity



2.2 Research Ethics

Researchers have ethical obligations concerning the treatment of those involved in and affected by their scholarship, which take precedence over other concerns, including transparency. (For a full discussion of these demands, see Report of the QTD Working Group on Research Ethics: Human Subjects and Research Openness, and the Report of the QTD Working Group on Research Transparency in Authoritarian and Repressive Contexts.) Researchers also have obligations to the profession and to truth as a regulative ideal, which encompass compliance with moral and legal standards concerning nondiscrimination, avoidance of conflicts of interest, exploitation of students, sexual harassment, and plagiarism, among others.

2.3 Knowledge Production and Research Integrity

History of science, sociology of knowledge, and cognitive psychology offer valuable insights into the challenges of knowledge production. They demonstrate the limitations of the heroic version of science by showing that the method-driven evaluation of evidence is *not* autonomous from broader contextual factors. They demonstrate how factors external and prior to testing influence research integrity in ways independent of the test results themselves. Furthermore, in pointing to the limitations to the heroic version of science, knowledge production makes it easier to understand the wide range of research traditions found in political science. History of science, for example, underscores that the ability to measure social phenomena increases with time and thus creates opportunity for more quantitative methodologies. Cognitive science, in turn, points to cultural biases that limit the ability to validly measure certain phenomena and thus calls for different research approaches. In short, they illuminate fundamental obstacles to objective knowledge and the resulting need for diverse tools to address those obstacles.

History of Science*:* Thomas Kuhn's *The Structure of Scientific Revolutions* (1962) popularized debates in the philosophy of science about the role of theory in defining what constitutes evidence and the role of epistemological assumptions in structuring perception. Many works by historians of science have illuminated the emergence of particular forms of evidence in particular socio-political contexts. Theodore Porter, for example, traces how efforts of nineteenth century civil servants to measure social and economic phenomena gave rise to statistical thinking (1986, 1996; Gigerenzer and Porter 1990). David Landes (1983), Carlo Cipolla (1977), Eviatar Zerubavel (1977, 1982), and Lynn Hunt (2008) demonstrate how various time-keeping devices have transformed understandings of temporality, history, and the very notion of "the past." Ludvig Fleck (1981) and Lorrain Daston (2001, 2008) analyze the changing nature of evidence over the past two centuries and the emergence of "facts." Sharon McGrayne

(2011) shows how the failure of existing frequentist techniques to crack the code of the German enigma machine and solve other intractable statistical problems in the 20th century led to the resuscitation of Bayes' ideas, which had laid intellectually fallow for over two centuries. Siddhartha Mukherjee (2016) reveals how the very notion of human genealogy was shaped by the discovery of new measurement instruments and sociopolitical contexts from the 19th century to the present.

The works of historians of science illuminate three points immediately relevant for current debates about transparency. First, historians of science make clear that techniques for handling evidence and assuring research openness have rarely had an epistemologically immaculate conception, as the heroic version of science might have us believe. Instead, they emphasize how practical research challenges, available technologies, and conceptual categories varied with research tasks at hand. Second, these works make clear that what counts as evidence, how it is best observed, and how it is to be evaluated have been contested questions for centuries, and answers to these complex questions defy a linear story of steady progress towards a singular notion of science. Third, new tools of inquiry can transform the very ontological categories that had heretofore informed scholarly inquiry. As the cited works on the history of clocks suggest, for example, particular mechanical devices transformed conceptualizations of time and the past, replacing cyclical, ahistorical notions of time with a more linear account. Inherited from the Ancients, who saw time as repeating itself continuously (Toulmin and Goodfield 1982), the cyclical conception of time constituted "the past" as little more than a "continuous present" (Eliade 2012). When the past is not qualitatively different from the present, it is impossible to trace a history, which presupposes that the past is different from the present and that causal factors can be identified to account for historical transformation. The invention of clocks, together with new insights from fields ranging from geology to evolutionary biology, transformed understandings of time, and contributed to the emergence of history as a distinct field of study in the 19th century. This single example illustrates how our confidence in understanding the past is conditional on the ontological conceptualization of time.

Sociology of Knowledge: Sociologists of knowledge explore knowledge production in contemporary contexts, often analyzing the practices of specific professions and scientific communities (Lyotard, 1979). Their starting point is the collective nature of scholarly inquiry as manifested in the development of professional associations, funding agencies, university departments and specializations, as well as academic journals. Since the 1870s, a distinct scholarly infrastructure emerged as science broke away from natural philosophy, humanities from philology, history from philosophy, sociology from history, political science from sociology. This development of intellectual specializations was a decisive step in removing the constraints on social inquiry established by religious and political authorities. Particular academic disciplines insisted on their sole prerogative to establish standards governing research practices, by appealing to emerging norms of academic freedom. Greater autonomy of scholarly communities in accrediting particular research practices, however, does not guarantee that accredited norms will be entirely disinterested or that social values exert no influence on sanctioned modes of valid research (Luke 1997: 345-363). In her investigation of peer evaluation among the professoriate, for example, Michèle Lamont (2009) traces the complex processes through which scholars try to reconcile concerns for excellence, disciplinary standards and interdisciplinary norms, objectives of funders, and, in some instances, political considerations She emphasizes the absence of a single metric for research integrity, showing how a wide range of subjective judgments contribute to assessments of professional competence. (See also Camic, Gross, and Lamont 2011; Zuckerman and Merton 1971.) University rankings and journal rankings also have a tremendous impact on how knowledge is evaluated in peer reviews, and on what sorts of knowledge are produced and taught within particular institutional settings (e.g., community colleges, liberal arts colleges, major research universities) (Schwartz-Shea and Yanow 2016). The recent popularity of experimental methods, for example, has contributed to a growing imbalance between testing and developing plausible, internally consistent theoretical propositions (Huber 2013; Swedberg 2014; Walt and Mearsheimer 2013). Publication practices of specific journals also influence knowledge

production. Length limitations imposed on submissions, willingness to permit old-fashioned footnoting, and policies pertaining to detailed literature reviews create powerful strictures on how scholars present their research findings (Gerring and Lee 2016; Harzing 2002; Trachtenberg 2015). A journal's preference for publishing novel, positive results has the effect of under-reporting negative findings, thereby establishing a publication bias (Findley, Jensen, Malesky, and Pepinsky 2016; Gerber and Malhotra 2008). The findings of certain studies within the sociology of knowledge have been deployed in the contentious debates over the DA-RT initiative, although they surface far more often in the works of critics than in the views of proponents of transparency.

Cognitive Psychology*:* Important psychological components of knowledge production have received a good deal of attention in recent years in cognitive psychology. Cognitive psychologists have illuminated a range of cognitive biases that structure the analytical abilities of human decision-makers. "Confirmation bias" explains why supporting evidence is over-valued and counter-evidence discounted (Cummins 2012). "Hindsight bias" reads current knowledge into the past, assuming linear progression, thereby masking alternative possible outcomes (Fischhoff 1982). The "representative heuristic" leads us to misjudge probabilities (Tversky and Kahneman 2000). Cultural psychologists, in turn, have shown that evaluation of evidence is shaped by cultural values (Sheena Iyengar).

Cognitive psychologists have also distinguished between two distinct modes of human analysis: fast, heuristic-based, intuitive thinking, which is our default mode; and slower, rule-based, inferential thinking that is less commonly used (Kahneman 2011). Investigating the analytical processes of cognitive scholars themselves, researchers have documented that despite their rigorous training, their analyses frequently operate in the default, intuitive and error-prone mode rather than the textbook-inspired, inferential mode. Philip Tetlock (2005) has documented a wide range of cognitive biases that shape the judgments of political experts, identifying variations in error rates that are closely correlated with two distinct cognitive mindsets. Building upon categories created in Isaiah Berlin's classic essay, "The Hedgehog and the Fox" (1953), Tetlock suggests that scholars who emulate fox-like characteristics, exploring multiple hypotheses, revising theoretical assumptions in light of new evidence, and engaging in extensive counterfactual thinking are far less error-prone than hedgehog-like scholars who dig in in the defense of favorite hypothesis. Nate Silver (2012) and Nassim Taleb (2007) have extended Tetlock's findings by drawing insights from cognitive psychologists in order to evaluate the effects of randomness on fields such as financial forecasting, sport betting, and political analysis. This literature demonstrates that all sorts of cognitive presuppositions and limitations structure scholars' definition of research questions, choice of methods, construction of evidence, and analysis of data in ways that impact research results significantly.

Scholarship addressing the history, sociology and psychology of knowledge production offer important reminders that the impetus for change in research practices stems from practical research challenges, technological innovations, historical contingencies and broad epistemological shifts, far more than idealized notions of heroic science. Thus, they caution against invoking singular epistemological principles to impose and enforce abstract research norms that occlude the diversity of research traditions within disciplines, and indeed, rule certain practices out of bounds. Logical positivists articulated complex philosophical arguments to demarcate science from non-science in order to shore up the foundations of empirical research. Yet their efforts to insulate an autonomous logic of discovery from claims concerning the history, sociology, and psychology of knowledge production reflect a distinct historical experience. Appleby, Hunt, and Jacob (2011, 167-170) suggest that many prominent logical positivists, who lived in interwar Vienna, objected to the politicization of science by fascist, Nazi and communist regimes. This historical experience influenced their insistence on narrowing the realm of scientific investigations to the empirically verifiable, which placed a premium on testing and replication as the key to establishing knowledge. By contrast, the growing attraction of Bayesian analysis reflects new psychological insights into human reasoning that acknowledges the critical role of heuristics and intuitions as well as the

continuously changing nature of human knowledge. Bayesian analysis recognizes subjective probability judgments in order to both acknowledge and rudimentarily estimate how reliance on heuristics and intuitions affect research integrity. It also conceives the research process as a form of continuous revision that allows space for emerging modes of evidence.

3. Research Traditions and Practices of Research Openness

The complexities of knowledge production underscore why handling of evidence and inferences drawn from it cannot be reduced and legitimated by a singular epistemological position, but instead reflect different research traditions with very different epistemological and ontological presuppositions. Each of these research traditions has developed its own criteria to evaluate research excellence and sustain confidence in scholarly findings. Subsequent sections of the report provide a discursive analysis of some of these criteria in the context of frequentist, experimental, process tracing, Bayesian, constructivist, and interpretivist approaches.

Frequentist & Experimental Traditions

DA-RT guidelines closely reflect the conception of research openness championed by experimentalists and proponents of statistical analysis. The guidelines' emphasis on data access, production transparency, and analytical transparency offer a crisp set of criteria that places a premium on replication. Research openness is understood in terms of formalized mechanisms for gathering, sharing and evaluating evidence to facilitate replication, reflecting the epistemological assumptions that research integrity is most effectively assured through reconfirming earlier results (King 1995). This epistemological position is tied to two distinct models of causality. Causation as robust dependence (also known as concomitant variation) infers causality from the robustness of statistical correlations among variables, when potentially confounding factors are controlled for (Goldthorpe 2001, 2–5). Causation as consequential manipulation (also known as the potential outcomes model) infers causality by "comparing what would have happened to a unit in regard to Y if this unit had been exposed to X (treatment)with what would have happened if it had not been exposed to X (control)." It simulates the counterfactual of "what would have happened if it had not been exposed" through randomization, which gives each Y an equal chance to be exposed or not exposed to X (Goldthorpe 2001, 5–8).[1] Both these models of causality make very specific ontological assumptions about the nature of evidence. They conceptualize the social world as analogous to the physical world, organized mechanistically such that evidence can be both uniform across cases and independent across time (Hall 2003; Sewell 1996). Within this frame, evidence is context-less, lacking any specific historical coordinates. The frequentist and experimentalist models are test-centric, stipulating that the causal inferences established through testing are largely autonomous of pre-testing stages of social inquiry. This model of research gives little attention to the influence that theorizing, test construction, or any of the stages of knowledge production have on research integrity.

Process Tracing & Bayesian Tradition

Causal process tracing evolved in response to critiques of the frequentist and experimental methods for under-specifying causal mechanisms. In its earliest version, process tracing closely resembled qualitative case-centric research with the minor difference that it employed a more explicit mechanistic conception of causality (Gerring 2008; Goldthorpe 2001). In recent years, however, a number of scholars have tried to ground process tracing in a more explicit Bayesian epistemology, demonstrating how new research practices evolve before they are given epistemological ratification (Beach and Pedersen 2013; Bennett 2008; Humphreys and Jacobs 2015; Kreuzer 2016). This Bayesian perspective employs a broader conception of research integrity than the frequentist/experimentalist model.

[1] The epistemological assumptions and limitations of these two conceptions of causality are discussed further by Stanley Lieberson (1985) and James Johnson (2006).

First, it views knowledge as evolving over time and insists that the confidence that can be derived from any piece of evidence is always conditional on how much prior research has been conducted on the subject and how conclusive that research was. In Bayesian terminology, process tracing seeks to estimate the prior probability that a particular claim might be true given the available foreknowledge. The implication of these methodological assumptions is that scholars must engage in extensive and careful analysis of the existing literature to properly estimate prior probability.

Second, Bayesian analysis insists that evidence supporting a particular hypothesis be challenged by any counter-evidence predicted by alternative, competing explanations. It draws attention not only to prior research validating a test hypothesis, but also to alternative approaches that challenge an hypothesis. It thus cultivates a symmetrical testing protocol through which alternative hypothesis are tested in full rather than relying on a control variable that only faintly reflects the full range of possible empirical predictions. It also does not treat all hypotheses as being created equal, but differentiates them on the basis of the number, precision, and uniqueness of the testable implications generated. In short, process tracing informed by Bayesian theory recognizes that the inferential leverage of a particular piece of evidence is not tied exclusively to the frequency of its observations, but depends upon the quality of the tests that the existing hypothesis permits. It further realizes that the quality of the available testing is something that requires intersubjective judgments. Finally, Bayesian analysis views any test result as providing only interim confidence in the validity of a particular hypothesis. It thus requires continuous analysis to update what it calls posterior probabilities in the face of new evidence.

Bayesian process thus offers a very distinct concept of research openness that places less emphasis on data access and production transparency than the frequentist and experimental tradition. Its more expansive view of the testing stages implies that analytical transparency entails something more complex than making data files available to other scholars. Ontologically, Bayesian process tracing is not yet very explicit. It emphasizes within case variations and thus does not spell out whether or not evidence has to be uniform or independent.

Historical Tradition

Comparative historical analysis, historical sociology, modernization theory, historical institutionalism, American Political Development, and path dependency are part of a long and distinguished historical tradition in political science. This tradition encompasses diverse epistemological assumptions but what unites them, and sets apart from the frequentist/experimentalist approaches and process tracing, is their attention to time, thus giving it a certain ontological unity. These methods insist that attention to temporality is a key element of research integrity and thus advocate greater openness to temporal matters and to change over time.

The historical tradition has criticized both the stasis and the presentism of methodologies that rely on hypothesis testing. Paul Pierson (2003) points out that test-centric epistemologies tend to operate in a short temporal structure that situates both causes and effects within a short time horizon, assuming that effects follow causes in close temporal proximity. Such epistemologies make no distinction between long-term structural factors and short-decision choices in explaining temporal outcomes (Pierson 2003). In effect they freeze time and assume that all independent variables take place simultaneously. As a consequence, temporal sequence, accounts of variation in duration, the tempo at which events unfold, and their timing on a historical calendar are all deemed inconsequential and banished behind the ceteris paribus parameters (Falleti and Mahoney 2015; Mahoney 2000; Pierson 2000). The historical tradition emphasizes that political explanation must be far more open to these different elements of temporality.

A smaller group of scholars within this historical tradition emphasizes not just the importance of time but also of history. This group contends that although time and history are related, they are actually two distinct elements in a research program. Sequence, duration, tempo and timing are elements of natural, objective, clock time that pays little attention qualitative changes across time. Yet, qualitative changes are the defining characteristic of history, and as such, the primary focus of traditional historians (Calhoun 1996; Knapp 1984; Sewell 1996). These more historically- minded scholars emphasize that it is not sufficient to attend to different elements of time, it also necessary to make conceptual differentiations about the past. They reject the notion that past is an ahistorical "continuous present" (Eliade 2012, 85), insisting instead that the past is "not just prior to the present but also different from it" (Schiffman 2011, 2). The analytical task at hand therefore is to explore and explain the differences that set the past apart from the present. And this task has led scholars to formulate different conceptualizations of the past: the past as simply a chronology of unconnected events (Rosenberg and Grafton 2010); a linear, teleological past (Sewell 1996); a sequence of distinct periods (Zerubavel 2003); or multiple concurrent and interlocking pasts unfolding at different rates (Braudel 1980; Orren and Skowronek 1996).

The historical tradition emphasizes the importance of the elements of natural, clock-time as well as different conceptualizations of the past, and thus places ontological considerations ahead of epistemological ones. Within political science, historical approaches do not have a single unified epistemology or an invariant analytical method. While those committed to social science history share a great deal in common with positivism (Appleby, Hunt, and Jacob 2011, 18–80), other approaches have more in common with set theory (Mahoney, Kimball, and Koivu 2009), or Bayesian analysis (Carrier 2012). Some historians of politics have little patience for epistemological debates, preferring to devote their energies to the endless complexities of finding and interpreting historical evidence. The historical tradition thus favors a different alignment between ontology and epistemology. It backgrounds epistemological principles to foreground the ontological complexities of time, whereas the frequentist approach backgrounds the complexities of time to foreground the explicitness of its epistemological principles. The historical tradition does not have highly formalized protocol to be transparent about temporal matters other than continuing to champion the discursive footnotes with specific page numbers.

Constructivist Tradition

Like most of the terms employed in this document, "constructivist" has been used in many ways for many purposes (see Adler 1997, 2013; Hopf 1998; Guzzini 2000; Checkel 2004; Hurd 2008; Abdelal, Blyth & Parsons 2010). We use it here to identify an epistemological position on research openness that is distinct from the preceding historical tradition and from the interpretivist tradition that follows. Defined in a certain way, it usefully highlights a distinct family of views.

The constructivist tradition is a view of social research that arises once we posit the theoretical possibility that human action operates through interpretive social constructs: ideas, norms, beliefs, identities, cultures, discourses, practices, and other interpretive filters through which people perceive themselves and their surroundings and arrive at action (Foucault 1980; Golinski, 1998; Hacking 1999). The possibility of influential social constructs has major implications for how we approach methods and evidence. For one thing, it implies that how certain people perceive, think and act may be qualitatively different from how others do (or how others *would* do under otherwise-similar conditions). That pushes our notions of useful evidence away from frequentist notions of pattern-seeking across cases or experimentalist notions of generally-relevant controls and towards case-based, contextually-situated, usually qualitative modes of analysis. For another thing, it requires that the methods and evidence for valid accounts of human action must somehow attempt to capture actors' points of view. That often pushes our notions of research openness even further into context and rich qualitative evidence,

suggesting that most good data is somehow garnered very close to the actors, or at least in close and thick observation of the writings, symbols, etc. they leave behind.[2]

To further clarify the distinctiveness of this view it is helpful to relate it to the historical tradition summarized in the preceding section. The line between the two is probably best drawn between that section's move from the "importance of time" to the "importance of history." In social science "time" is a word that stands in for causal complexity; the reason we need to pay attention to how things happen in time is due to complex asymmetric and contingent interactions. As the preceding section captures well, this is what scholars like John Brady, David Collier, Paul Pierson, or James Mahoney see as the reasons why frequentist or experimentalist methods and evidence may not tell us what we need to build useful knowledge: those traditions generally presume quite regular and symmetrical causal relationships that may not exist (or at least may not predominate) in human action, and so they lack the right kinds of research openness or integrity because they do not gather data in ways that tend to capture more complex causality well (Brady & Collier 2004; Pierson 2004; Mahoney 2000; 2010; Goertz & Mahoney 2012). By contrast, the notion of the "importance of history," which is described above as "qualitative changes across history" or "different conceptualizations of the past," centers on the role of subjectivity. It emphasizes that people from one context (which includes both time and place) may perceive/think/act through qualitatively different "conceptualizations" from those in other contexts. Pierson and Mahoney, like many institutionalists, pay no real attention to this second notion. They are no more interested in social construction and actors' "conceptualizations" than most frequentist or experimentally-inclined scholars. The constructivist tradition is sympathetic to their core emphasis on conditional, conjectural causality that comes together in cases—not in smoothly-distributed variables whose average effects would tell us much—but it extends that sense of contextual conditionality much more deeply in adding the role of social construction. This takes it a major step further away from a search for frequentist, law-like regularities, placing it "further out" on Figure 1's spectrum of epistemological views.

But Figure 1 also suggests that a distinctive constructivist position is not as "far out" as an interpretivist position, and to understand constructivism it is helpful to consider this boundary as well. The core move on this side is that the distinctive constructivist position remains "closer" to more traditional epistemological views because it remains tethered to some version of realism. That is, the position we are calling distinctively constructivist is one in which scholars draw on scientific, critical, or pragmatic realism (Bhaskar 1986; Putnam 1989; Wendt 1999; Wight 2006) to effectively claim more access to a "real world" than self-labeled interpretivists are inclined to do.[3] This position, in vastly simplified terms that gloss its advocates' many caveats about pragmatism and tentative assertions, is that the world really is socially constructed, and we really can show that this is so (most famously, Wendt 1999; others in this vein include Katzenstein 1996; Finnemore 1996; Blyth 2002; Parsons 2003; Abdelal

[2]It is possible to argue that this second point is actually a consequence not only of constructivist thinking but of any post-Humean view of causality and explanation that steps beyond correlation to call for spelling out and documenting causal processes to some degree. A rational-choice account of human action that attempts to specify and document its causal process also must capture actors' points of view, since the process it posits obviously passes through such points of view and is not demonstrable without them (Parsons 2015). Thus we could arguably locate this second point up under the "process-tracing/Bayesian tradition" above. Still, it is fair to say that once we posit the possibility of social construction, we become *especially* concerned with adopting methods and evidence that would capture actors' points of view.

[3]Once again, "constructivism" has been defined in many ways, and some will object strongly to *defining* constructivism as epistemologically realist (like, presumably, Guzzini 2000; Zehfuss 2002; Jackson 2010; Pouliot 2010). But if we ask the question in this section—what is an epistemological view of research openness that stands between historical and interpretivist views?—then the answer takes us to a form of constructivism that is epistemologically realist. We are using these terms here only to elucidate different epistemological views of research openness, and do not take a position on whether or not this use of "constructivism" is the most useful purposing of the word more generally for the study of politics.

2007). Thus if constructivists go beyond the historical tradition in adding the major research challenge of social construction, they remain in direct debates with members of the historical tradition (and even representatives of traditions "further back" toward scientific orthodoxy) about describing and explaining a real world. They agree with the historical tradition that human action is characterized by more complex causality than most natural processes, and add that it is also riddled through by the particular-to-humans dynamics of social construction—and yet still hold that we can and should try, as best we can, to make claims about why the world came to look the way it looks.

This relative confidence (again, with many caveats) in characterizing a world that should be accepted as real is the crucial difference between how constructivists and interpretivists approach the *practices* of research openness. This difference is actually less clear at the level of abstract epistemology, where it can be hard to nail down exactly how much constructivists and interpretivists disagree. As we have seen earlier in this document, most leading advocates of a post-positivist correspondence theory of truth, or "presupposition theory," hold on to the idea that their theoretical interpretations are somewhat "world-guided" (Williams 1985, 140) with our access to something "out there" setting parameters on what we think can make sense (Brown 1977, 93). The interpretivist section below also stresses a reliance on "facts," "accuracy" and "logic." But if constructivists and interpretivists overlap in a deep epistemological mix of interpretation and worldly parameters, they visibly separate as they take up practices for designing, pursuing, and publishing research in today's political science. The scholars we are calling constructivists set up their research practices to compete with non-constructivists (frequentists, experimentalists, process-tracers and Bayesians, and historicists) over what counts as facts, accurate characterizations, and the logic of causal-explanatory accounts that knit them together. This is not to say that they minimize their differences with these traditions—to the contrary, they spend much of their time arguing that these other traditions fail to gather the right sorts of evidence, and fail to theorize the kinds of deeply complex and contingent logics of action that social construction can generate—but they set up methods and evidence to try to convince these adversaries empirically of their insights. For them, research openness centers on being careful and explicit about context: If we allow theoretically that action could be very contextually conditional, and gather information in the context-sensitive ways this possibility requires, we can achieve rigorous and tentatively trustworthy claims about human action. For interpretivists, by contrast, the supposition of a socially constructed world points toward other practices. They remain partly "world-guided," but they see that access to "the world" as so socially filtered that parsing it in competition with non-constructivist accounts is simply not the goal (Winch 1958; Taylor 1971; Bevir & Kedar 2008; Adler & Pouliot 2011).

Interpretivist Traditions and the Critique of Transparency

One of the challenges in addressing the question of transparency is the highly equivocal nature of its meaning and how different conceptions of it can easily co-exist within a single argument. Different meanings of transparency in particular social and political contexts raise questions about its possible meaning in the field of scholarship and ideas. In social contexts, the language of transparency typically connotes "accessibility" and "availability" in contrast to what is hidden and evasive. In political contexts, a transparent society is one frequently characterized as devoid of grey areas or "moral and economic subgroups" that challenge the state's purview (Geroulanos, 2016, 2017). But as social theorists have long emphasized, no society is ever transparent to itself, any more than an individual is (Adorno, 1969). By extension, no research agenda, article, or book has any meaningful claim to transparency, no matter how fervently it is proclaimed.

Once transposed to scholarship, illusions of transparency can easily lead to conceits that silence forms of scholarship in the name of an ideal that is itself open to contestation. Qualitative and interpretative research is frequently called into question precisely because they are concerned with that which is not "accessible" or "available," whether their investigations explore "society," "the market," or

"the state." As conceptual constructions or ideal types in the tradition of Durkheim and Weber, these phenomena are never encountered as such, yet few doubt the existence of their complex realities (Schutz 1967). When scholars study discourse and ideology or structures and markets, the object of study is not transparent to the state or the observer. Instead, it requires imaginative reconstruction on the basis of clues and traces available. As such, it is interpretative and non-transparent. Within an interpretive frame, the regulative ideal is critical reflexivity—a propensity to examine, reexamine, and think again—toward one's own scholarship, and the scholarship of others, both those within one's research tradition and those who do not share one's epistemological assumptions, while acknowledging the historicity of one's position without conflating historicity with relativism or arbitrariness (Bourdieu, 2000).

To deny transparency as a legitimate benchmark for all political analysis is not to abdicate all judgments of quality. On the contrary, scholarship is assessed and evaluated on the basis of accuracy of facts, logic of argument, and manifold strictures governing particular interpretive methods. In other words, how accurately the relevant evidence is presented or handled; how much of the existing stock of relevant evidence the work in question accounts for; and how cogent the interpretation or argument offered is—all figure in assessments of quality. Leaps in logic and mishandling of evidence are considered within frameworks of agreement about what counts as a cogent argument and what constitutes relevant evidence. These are contested questions but not insurmountable questions within research communities. Creativity, innovation, and changing theoretical frames add new dimensions to understandings of the operative logic of arguments and the contours of relevant evidence, especially in interpretative and qualitative work that is concerned with what is not readily available and thus remains hidden or constitutes a gray area for which different conceptual and epistemological protocols may be needed.

Critical reflexivity ensures opportunities to go beyond what is accessible and available and ponder what is hidden and occluded, while transparency as a regulative ideal precludes such investigations, conscripting heterodox scholarship into terminology that tacitly denies the core of their concerns and the contribution this scholarship seeks to make (Husserl 1970; Cassirer. 2000). Consider, for instance, works concerned with racial domination, or the reproduction of structures of power, or structural violence. The challenge in each case is to probe inequities that are explicitly denied by mainstream approaches. In such cases, new methodologies generate new ways of seeing, measuring, analyzing and provide non-arbitrary criteria to establish the cogency of the claims advanced—criteria that challenge established scholarship. Forcing interpretative and qualitative scholars to conform to axioms and categories such as "transparency" that are presented as neutral not only makes contentious knowledge claims impervious to criticism, but derails investigation of pressing political issues (Foucault 1980; Lyotard 1979).

As a scholarly discipline, political science has devised complex conceptual practices that are theory-laden and methodologically driven. By sustaining notions that knowledge is "discovered" and truth "revealed" through systematic observation and testing, and the replication of findings, transparency norms actively divert attention from diverse theoretical presuppositions and particular institutional ideologies operating within political science itself. By shoring up mistaken notions of fungible minds, transparency talk misses the sociality of perception, the theoretical constitution of facts and the politics of representation. Ironically then, in its quest for truth, transparency talk affords a kind of ideological immunity to conceptual practices of power consolidated within particular research traditions.

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