

## **Philosophy of Science: The Pragmatic Alternative**

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Center for Philosophy of Science

University of Pittsburgh

### **ABSTRACTS**

#### **Matthew Brown**

University of Texas at Dallas

Title: A Pragmatist Logic of Scientific Practice

Abstract: Philosophy of science in practice advocates "a philosophy of scientific practice, based on an analytic framework that takes into consideration theory, practice and the world simultaneously"(SPSP, "Mission statement"). I would like to offer up classical pragmatism as one candidate for such an analytic framework. According to John Dewey, "pragmatism" is "the logic and ethics of scientific inquiry." C.S. Peirce describes it as "nothing else than the logic of abduction." I follow their lead, setting out a pragmatist account of the "logic" of scientific practice, i.e., a general theory of the forms of scientific inquiry or inference. On my account of the pragmatic logic of scientific practice, scientific inquiry is a response to practical problems, to perplexities in scientific practices of prediction, explanation, and control, which are themselves situated in and responsive to a broader social situation. The general features of scientific inquiry (problem-statement, data, facts, hypothesis, theory, reasoning, experimentation) are forms that arise in the course of scientific inquiry and are defined functionally in terms of their role in resolving the practical problems which occasion inquiry. This form of pragmatism has much to recommend it as a general framework for philosophy of scientific practice. In particular, I will focus on how the pragmatist framework I describe provides accounts of evidence, testing, and knowledge particularly suited to resolving some classic problems about the nature of scientific evidence.

#### **David Danks**

Carnegie Mellon University

Title: Unifying Pragmatic Theories

Abstract: One common claim about pragmatic accounts of scientific theories—often presented as an objection to those accounts—is that they necessarily imply that science is disunified. Pragmatic accounts are thought to be incompatible (in some sense) with the very possibility of unified, coherent scientific theories of any significant scope. Roughly, the usual argument here is that the pragmatic accounts imply that different goals, technology, social structures, or other

factors typically lead to scientific theories that posit different objects, laws, relations, or structures, where those resulting scientific contents are rarely, if ever, reconcilable. In contrast, this talk will explore the possibility of *unified* pragmatic theories. I begin by developing a general account of theoretical unification guided by intertheoretic constraints. On this model, constraints provide the primary intertheoretic “glue” that binds compatible theories together, and shows where incompatible theories conflict. This focus suggests that the key to the unification question is whether the intertheoretic constraints implied by particular pragmatic theories or claims are actually incompatible with one another. If so, then we have disunification; if not, then we have at least the possibility of unification.

When we focus on intertheoretic constraints, we find that there is an important distinction between different pragmatic accounts of science, centered on the particular underlying reasons or motivations for the pragmatism. At a high level: (a) pragmatism based in epistemic considerations (e.g., explanatory power, ontological truth/accuracy) leads to theories that are likely incompatible; (b) pragmatism based on practical considerations (e.g., control, data predictability) usually leads to compatible theories. That is, the connection between pragmatism and disunity is much more complex than usually assumed.

Throughout this talk, I will draw examples from multiple scientific domains.

**Richard Healey**  
University of Arizona

Title: *Laws and Chance: A Pragmatist Alternative to Metaphysics*

Abstract: The status of laws and chance has been the locus of a lively debate in recent philosophy. Most participants have assumed laws and chance play an important role in science and sought their objective ground in the natural world, though some skeptics (Giere, van Fraassen) have questioned this assumption. So-called Humeans seek such a basis in particular facts such as those specified in David Lewis’s Humean mosaic. Their opponents (e.g. Maudlin) argue that such a basis is neither necessary nor sufficient to support the independent existence of objective scientific laws and chance.

This essentially metaphysical debate has paid scant attention to the details of scientific practice. It has mostly focused on so-called fundamental laws, assumed to take a particular form (such as Maudlin’s FLOTEs). I propose a pragmatist alternative—not as another position in the debate but as an alternative to the debate itself. This pragmatist alternative offers a view that questions the representational conception of objectivity presupposed by all participants to the debate.

Statements of law and chance serve many different purposes in science, some of which I’ll illustrate. But their central role is in inference, primarily to guide the expectations of an agent whose situation limits what information is accessible to that agent.

Probabilistic laws do not state chances. Chance is single-case probability, a concept that is applicable even in the absence of explicit probabilistic laws. But instances of probabilistic laws

permit inference to chances in particular circumstances. The more universal and insuperable the limits on accessible information, the more objective are the chances that help transcend them. A modified Lewisian chance (relative to a spacetime point or region) may be located at one end of a spectrum of objectivity that is visible only to physically situated agents like us. It does not supervene on the Humean mosaic, but nor does it help generate it. Though fundamental in current science, quantum chance has no more *metaphysical* significance than a ticket's chance of winning the next drawing of the Pennsylvania lottery.

**Jenann Ismael**

University of Arizona

Title: On Chance (or, Why I am only a half-Humean)

The main divide in the philosophical discussion of chances, is between Humean and anti-Humean views. Humeans think that statements about chance can be reduced to statements about patterns in the manifold of actual fact (the 'Humean Mosaic'). Non-humeans deny that reduction is possible. If one goes back and looks at Lewis' early papers on chance, there are actually two separable threads in the discussion: one that treats chances as recommended credences and one that identifies chances with patterns in the manifold of categorical fact. I will defend a half humean view that retains the first thread and rejects the second.

My suggestion is that what the Humean view can be thought of as presenting the patterns in the Humean mosaic as the basis for inductive judgments built into the content of probabilistic belief. This will be offered as a template for accounts of laws, capacities, dispositions, and causes – i.e., all of the modal outputs of Best System style theorizing. In each case, the suggestion will be, these are derivative quantities that encode inductive judgments based on patterns in the manifold of fact. They extract projectible regularities from the pattern of fact and give us belief-forming and decision-making policies that have a general, pragmatic justification.

**Kerry McKenzie**

University of California, San Diego

Title: In search of a pragmatic metaphysics: lessons from structuralism

Central to pragmatist philosophy is its acknowledgement of human liability to error, and its corollary that 'perfection' – in science as in life – is something 'far off and still in the process of achievement'. But this idea that we are apt to be wrong about the world and may yet also hope to make progress in future is shared as the central vision of structuralist philosophy of science. Introduced by John Worrall in 1989 in response to the litany of errors outlined in Laudan's pessimistic induction, epistemic structuralism aims to model scientific knowledge in such a way as to accommodate human limitations with regard to the unobservable, while also making future

scientific commitments viewable as *perfections* or *improvements* of contemporary commitments as opposed to their outright supplantations. Given the close connections that evidently exist between pragmatist and structuralist philosophies, one might then wonder whether it is to structuralist metaphysics that we should look to in order to develop a more pragmatically oriented metaphysics of science.

I will argue that – at least as things stand – the opposite is in fact the case. Structuralist metaphysics in its contemporary incarnation presents itself as a naturalistic metaphysics of the fundamental, with ontic structuralists drawing on our best current physics to argue for the existence of ontological priority relations between metaphysical categories. I will argue that this is in fact a project of analytic metaphysics that cannot hope to make true claims in advance of a final physics theory. More significantly, I will argue that there is also no sense to the idea that such claims, while false, can represent ‘progress’ towards the true metaphysics to be revealed at the end of enquiry. At the root of this latter problem is that fact that the categories of analytic metaphysics have what James would call a ‘one-drop’ character – something that makes them in principle resistant to any concept of approximation or improvement. However, with our errors now in hindsight, we are in a better position to imagine what a metaphysics of science should look like if it is to be consistent with the shared motivations of both structuralism and pragmatism.

**Laura Ruetsche**

University of Michigan

Title: Pragmatism, Perennialism, and the Physics of Ignorance

Abstract: Investigations of the foundations of quantum field theories have suggested (at least to me) the thesis that theory *specification* has a pragmatic dimension: strategies for equipping physical theories with content, if sensibly pursued, eventuate in contents indexed not only (or not just) to the way the world is but also to our aims in using our theories and the circumstances we use them in. Realists and representationalists resist the move to pragmatize theoretical content. They say the move rests on artifacts of the present incomplete state of physics. *Fundamental* physics, they contend, can only be properly understood if it’s understood as representing the way the world is. Anyone who thinks otherwise, they suggest, has paid too much attention to incomplete and un-fundamental sciences. Since none of the physics at hand is genuinely fundamental, this representationalist maneuver seems to land us in a dialectical impasse. To assess the move to pragmatize theoretical content, we need to know things of which we’re ignorant---the future of science, the nature of fundamental physics. In my talk, I’ll try to negotiate this impasse by developing two reasons to predict that future scientific theories, including theories of “fundamental physics,” will continue to be best understood as possessing pragmatized content.

**C. Kenneth Waters**

University of Calgary

Title: Ask Not “What is an Individual?”

Abstract: Philosophers of biology typically pose questions about individuation by asking ‘What is an individual?’ For example, we ask, what is an individual species, an individual organism, or an individual gene? I will use my analysis of conceptual practice in genetics to motivate a more pragmatic approach. I will contend that instead of asking ‘What is a gene?’, we should ask: ‘How do biologists individuate genes?’ ‘For what purposes do biologists individuate genes?’ ‘Do their practices of individuating serve these purposes?’ I will then apply this approach to the debate about whether holobionts (assemblages of a host with microbial symbionts) are individuals. I will argue that biologists and philosophers have framed this debate with the wrong question. Instead of asking whether holobionts are individuals, we should ask why biologists individuate holobionts and whether their individuating practices serve important purposes.