

Metascience and the Philosophy of Science

PoS Meets QSoS, 2024-05-28

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If you're ever tempted to ask "why aren't people working on X," the answer will always be "they are and you aren't reading them"



Outline

1. What might 'metascience' mean?
2. "Naturalism," the descriptive, and the normative in PoS
 - 2.1 Quine, of course
 - 2.2 A spectrum of "naturalisms"
3. Practice and pragmatism: a way out?

The take-home: Philosophy of science and metascience have had an uncomfortable relationship, at least in part, because of their widely differing stances toward normative commitment

The Meaning(s) of Metascience



Mario Bunge (1919-2020)

Bunge's Metascience

- philosophy *of* science (examining science's methods & results)
- philosophy *in* science (philosophical implications, consequences)
- philosophy *from* science (traditional questions, scientific basis)
- philosophy *with* science (up-to-date with scientific development)
- philosophy *for* science (helpful to scientific practice)

...but not

philosophy *over* science, which:

...suggest[s] a discipline higher than the special sciences either in penetration, value, or power of some sort: a kind of *scientia reatrix* claiming such a final rectorship that scientists just ignore it. And rightly so: scientific inquiry welcomes criticism but does not tolerate edicts; science is its own law-giver. (Bunge 1959, 7)

Feyerabend on Bunge

First of all, however, it is never clear whether the “Inventory” [of methodological rules] is supposed to be the result of empirical research concerning the way in which contemporary scientists proceed, or whether its items are supposed to be norms rather than descriptions. (Feyerabend 1961, 401)

Bunge on Normativity

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Metascience “discloses conceptual sickness and prescribes treatments for it” (1959, 26)

Contemporary Metascience

Modern metascience is neither a descendent of philosophy nor social studies of science. Instead, it is better understood as a scientific social movement advocating for significant changes to scientific practice and policy to meet what they perceive to be a “reproducibility crisis.” (Peterson & Panofsky 2023, 151)

Contemporary Metascience

**...metascience represents the confluence and cross-fertilization of three, preexisting trends: (1) statisticians and experimental methodologists promoting greater research integrity, (2) quantitative studies of science by data scientists (what is called “science of science” or SoS), and (3) open science activism.
(P&P, 152)**

Diagnosis and Cure

Although the scale of the new SoS was new, what really separated it from its predecessor was a willingness to transition from a strictly descriptive science to a diagnostic and experimental one. (P&P, 158)

Diagnosis and Cure

If we're going to do research on the scientific process, then why would we not want to use that evidence to be able to improve the research enterprise? So, not just doing meta-research for the sake of research, but for the purpose of actually translating that evidence, those insights into change that benefits everyone. (Interview w/ Wellcome Trust staff member, P&P, 161)

Diagnosis and Cure

COS is a culture change organization that aims to align scholarly values with scholarly practices. It does so by developing and advancing a systems-level strategy for changing culture and behavior toward greater rigor, transparency, and sharing of research process, outputs, and outcomes. (COS / Nosek 2017)

**In short: no qualms here
about normative
intervention.**

Naturalism and Normativity in Philosophy of Science

“Those people don’t read scientometrics. They don’t read STS works. They just reinvent the wheel.”

(Gingras, quoted in P&P, 158)

On the other hand, the project itself seems to be founded on a set of ideas that find few supporters in the philosophy or social studies of science: that “science” is a coherent entity on which to intervene, that there is a singular method for science, that “efficiency” is a meaningful concept in the area of basic research. (P&P, 166)



W.V.O. Quine (1908-2000)

The reason I shall not be impressed by this is that my position is a naturalistic one; I see philosophy not as an *a priori* propadeutic or groundwork for science, but as continuous with science. I see philosophy and science as in the same boat—a boat which, to revert to Neurath's figure as I so often do, we can rebuild only at sea while we are staying afloat in it. There is no external vantage point, no first philosophy. (Quine 1969, 127–8)

Traditional epistemology was in part normative in intent. Naturalistic epistemology, in contrast, is viewed by Henri Lauener and others as purely descriptive. I disagree. Just as traditional epistemology on its speculative side gets naturalized into science, or next of kin, so on its normative side it gets naturalized into technology, the technology of scientizing. (Quine 1995, 258)

For a richer array of norms, vague in various degrees, we may look to the heuristics of hypothesis: how to think up a hypothesis worth testing. This is where considerations of conservatism and simplicity come in, and, at a more technical level, probability theory and statistics. (Quine 1995, 258)

I'd Love to Be a Naturalist—if Only I Knew What Naturalism Was

Lawrence Sklar^{†‡}

Naturalists tell us to rely on what science tells about the world and to eschew aprioristic philosophy. But foundational physics relies internally on modes of thinking that can only be called philosophical, and philosophical arguments rely upon what can only be called scientific inference. So what, then, could the naturalistic thesis really amount to?

1. Naturalism. What is there in the world? And what is it like? “Let science be your guide.” Let’s call this “naturalism.” This slogan has both a positive and a negative side. The positive side is the assertion that the

As to the question what counts as evidence, it is simply not true that this question can be *settled* by scientific method alone, as the phrase “the last arbiter” suggests. An appeal to scientific method(s), amorphous or not, plays an important role in such debates, but the relation is less direct than Quine suggests... (Keil 2003, 257)

**The clarification and analysis of our most basic concepts may be viewed as part and parcel of the scientific enterprise, if we embrace Quinespeak [i.e., and consider “science” to refer to the sum of human knowledge], but it still does not belong to that part of science which directly faces the tribunal of experience. It belongs to the more general and more abstract part of science which some non-naturalist philosophers like to call *a priori*.
(Keil 2003, 273)**

Arthur Danto

Should there be a conflict between common sense and science, it must be decided in favor of science, inasmuch as it employs, but more rigorously, the same method that common sense does and cannot, therefore, be repudiated without repudiating common sense itself. (1967)

Ludwig Wittgenstein

Philosophers constantly see the method of science before their eyes, and are tempted to ask and answer questions in the way science does. This tendency is the real source of metaphysics, and leads the philosopher into complete darkness. (1972)

Spectrum: From Danto to Wittgenstein, via Quine

There is massive nuance and deep, fundamental disagreement in the philosophical debate – which is almost entirely lacking in the way metascience considers its normative orientation.

Practice and Pragmatism

**We aren't lacking in models of nuanced,
middle-road approaches to the normativity of
philosophy-of-science or metascientific work**

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...we just need to look in the right places!

Philosophy of Science in Practice

Concepts like “gender,” “equality,” “poverty,” and “well-being” all have an inextricable mix of descriptive and evaluative content, and the attempt to regiment concepts into purely descriptive and normative ones distorts what such concepts mean and impair our ability to articulate, operationalize, and reason with such concepts. (Brown 2021, 55)

Pragmatist Philosophy of Science

These methodological changes were not sanctioned by some super-method or an overarching theory of physics, but only by some detailed case-by-case arguments about how the telescopic or thermometric observations should be given more credence than unaided perception. (Chang 2022, 64)

Pragmatist Philosophy of Science

Evaluation is complex business, and I think the structure of activities and systems that I have outlined helps us make sense of the complexity involved. Overall evaluative notions like truth and success need to be dissected significantly in order to become applicable to systems of practice, and the talk of the aims of science and general epistemic values/virtues need to be concretized in the context of each activity and system we are considering. (Chang 2014, 77)

Lessons

- 1. For philosophers: rethink the ways in which we separate descriptive and normative enterprises; be prepared to see this frontier dissolve.**
- 2. For metascientists: abandon the idea(l) of a singular Scientific Method; embrace more local-scale interventions.**
- 3. For metascientists: rethink the ways those local contexts impact “global” notions like truth or success; be prepared to see them dissolve into cluster concepts.**

Questions?

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The value proposition of SciSci hinges on the hypothesis that with a deeper understanding of the factors behind successful science, we can enhance the prospects of science as a whole to more effectively address societal problems. (Fortunato et al. 2008, 1)

The field of metascience — the scientific study of science itself — is flourishing and has generated substantial empirical evidence for the existence and prevalence of threats to efficiency in knowledge accumulation. (Munafó et al. 2017, 1)