

Some important reads related to the philosophy of science

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Often classroom discussions involve assumptions related to the philosophy of science. For those who are interested, I have curated a short list of readings which are very much worth reading to get a better understanding of the relevant issues. There are definitely better reads than what I have listed (for example, Karl Popper, Imre Lakatos¹, Paul Feyerabend, Larry Laudan, Elliot Sober, Hasok Chang, Deborah Mayo,...); however, I wanted to list things that were balanced while still conveying the issues in a thoughtful fashion. Btw, the Stanford Encyclopedia of Philosophy is an excellent resource for philosophical issues and for issues related to cognitive science more specifically. I hope you'll all look at it more in the future! Here goes:

1. Here is a brief [blogpost](#) that I like on the development of the “scientific method”. Really the phrase is meaningless, and usual descriptions of it are terrible. They make science sound like a boring algorithm; when it reality, scientific work involves a combination of *creativity*, rationality, stubbornness, hardwork, and luck. A much longer, but thought-provoking, read is the book [Against Method](#) by Paul Feyerabend.
2. The demarcation problem ([short read](#), [long read](#)).
3. The problem of induction ([short read](#), [long read](#)). This is my favorite issue in the philosophy of science :) - so much food for thought here! This is related to the issue of simply learning from experience (without an a priori theory). Note, Popper’s solution to the problem of induction was to state that it is unsolvable. Instead, he suggested that it is better to conjecture hypotheses, evaluate consequences, and then test them, i.e., theory first! This is the solution that resonates with me the most.
4. The relationship between theory and data ([short read](#), [long read](#)). I would actually start by reading the conclusion of the long read and then reading the rest, as the conclusion nails the relevant issues.
5. Finally, if you want to read a whole book about the messy nature of science, and about how “theory first” is a bit simplistic when we view history, I can’t recommend Hasok Chang enough. Particularly, [Is Water H2O?](#). Note, this clearly contradicts my own preferred view (as mentioned above). But, it is extremely important to be plural in your thought even if you have a preferred viewpoint. An absence of a healthy dose of plurality in your thinking is unhealthy.²

All of these issues have a long philosophical history and it is quite useful to read them. It is a mistake to depend on our naive intuitions about science, instead of looking at history to see what worked. As Chomsky likes to say, there is no “correct way” to do science, there is a way that worked in the past, and that’s the best we have.³ More generally as Churchill put it, “those that fail to learn from history are doomed to repeat it” ☺.

I hope you will enjoy the path to a deeper, more enriched, scientific experience after reading these!

¹There’s a brief but really awesome 1974 lecture by Lakatos that gets at the relevant facts very quickly ([video](#), [pdf](#)).

²Note, this is to be contrasted with your preferred viewpoint/working theory, which needs to be singular; to steal an aphorism from a totally different context, *think global, but act local*. I say this because, as far as I am concerned, trying to choose a single viewpoint over others forces one to really debate the issues and grapple with the facts. The process also gives one motivation and direction; both are crucial ingredients in pursuing research.

³This is an inductive argument, which is quite ironic given Chomsky’s general viewpoints.☺ He has said in some places that he likes Charles Sanders Peirce’s pragmatist viewpoint.