The Theoro-centric Bias: Philosophy of Science and Cognitive Science

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Epistemology and Scientific Practice

Some important contemporary theories of cognitive and conceptual development have been deeply influenced by philosophy of science. Unfortunately, this influence has been almost completely from philosophy of science that makes scientific theory seem more unified that it is. While Hacking, a critic of this tradition, is sometimes cited, the lessons of his critique of such "theoro-centrism" seem to have either been ignored or missed. It is the task of the work reported here to explore some of the effects the influence of theoro-centrism has had on cognitive science. The focus of this work is on those cognitive theories which hold that there is a strong analogy and continuity between scientific and intuitive theories.

Traditional philosophy of science was dominated by a limited image of scientific theory. This image was the result of construing scientific theory as an epistemological object, that is, making scientific practice fit into a pregiven normative epistemological niche. In order to do this, traditional philosophy of science interpreted scientific theories in abstraction from actual theoretical and experimental practice in science and created the idea of a theory as a relatively autonomous vehicle of inference. By packing into this notion of a theory many importantly different activities and forms of representation, both different senses/levels of "theory" and different theoretical practices, "theoro-centric" philosophy of science interpreted scientific theories as closed, self-contained units and ascribed to them the power of prediction, explanation, description, etc.

Recently, some philosophers of science have begun to explore a different approach to understanding science. Eschewing the traditionalist's idea that scientific practice needed to be reconstructed according to some prior set of epistemological canons and set of epistemic tools, they have focused on scientific practice itself. When such "practice-centered" philosophers examine what are called scientific theories, they find that the ordinary term "theory" in science covers a heterogeneous assortment of practices, from the use of abstract guiding metaphors to particular physical analogies. They also note the ways in which more speculative practices, to borrow Hacking's term, are embedded in other, less narrowly "theoretical" practices such as model-building, idealization, etc. Hacking (1983, 1992) and Cartwright (1995), for example, show that it is this ensemble of practices that allow us to do the things which traditional "theoro-centric" philosophy of science ascribed to a single category or entity, "theory".

Scientific and Intuitive Theories

Gopnik and Wellman (1994) represent well the adoption of theoro-centrism in cognitive science. They explore and defend the "theory theory", i.e., the theory that the development of children's social and psychological competence is best explained by changes in an intuitive theory of mind possessed by children. They argue that such intuitive theories are the same, in crucial respects, as scientific theories as the latter have been understood in (theoro-centric) philosophy of science. Thus the notion of a "theory" is moved from an epistemological role to a hypothetical one. They postulate intuitive theories in order to explain such phenomena as resistance to counterevidence and patterns of explanation and prediction. The problem is that, according to practice-centered philosophy of science, there is no one level of theory or type of theoretical practice that explains all of that in science. I argue that the appeal to a unified notion of "theory" in cognitive science seems no more promising.

My concern is that the use of theoro-centric philosophy of science in cognitive science has produced explanations that cover over phenomena that need better explanations and theoretical options that could provide them. There are other ways to explain how prior conceptualizations affect current and future ones, the psychological aspects of scientific and naive theory use and change, or the sense in which the analogy between children and scientists might be useful.

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