

## Paradigm Shifts

Thomas Kuhn (1922-1996; American philosopher of science), in his famous book *The Structure of Scientific Revolutions* (1962), argues that “science” does not progress as a linear accumulation of new knowledge, but undergoes periodic revolutions called “paradigm shifts.” A “paradigm” is a specific theoretical orientation, based upon a particular epistemology and research methodology, reflective of a particular scientific community at a particular time in history. A paradigm frames and directs the nature of type of research inquires generated from that theoretical orientation, as well as provides the fundamental basis for evaluating the results of the generated research. A paradigm provides the questions for – what should be asked, what phenomena should be observed, and how should the observations are to be interpreted. A paradigm reflects a consensus view of a particular scientific community, bought into by the members of that community, either consciously articulated or, more likely, simply assumed and not intentionally acknowledged.

In general, a particular scientific paradigm goes through three distinct phases. There is initially something akin to a “prescience,” within which a community of scientists lack a central paradigm, but from which an archetypal begins to emerge. This is followed by “normal science,” when members of the scientific community attempt to enlarge the central paradigm design by a sort of “puzzle-solving.” That is observed, what is research, and how it all is interpreted conforms to the edicts framed by the paradigm, a completing of the puzzle. When observations or the results of research do not conform to the paradigm, they are seen as not refuting the paradigm, but as the mistake of the researcher. The paradigm drives the research, building upon itself, becoming more solidified and realized. But as more and more anomalous and incongruent results build up, the paradigm of the scientific community reaches a “crisis.” At this point a new paradigm could emerge and become accepted by the community, which subsumes the old results along with the anomalous results into one new paradigm framework. This is termed “*revolutionary science*.” Kuhn also argues that rival paradigms are “incommensurable,” i.e., it is not possible to understand one paradigm through the conceptual framework and terminology of another rival paradigm. As a member of a scientific community, our “reality” is determined by the paradigm through which we see the world. Only when we reach a “crisis” will a change in paradigm come forth. Science is not a neat steady evolution in awareness, but a series of puzzle games, marked by transformative revolutions.

Examples of such paradigm shifts include the cosmos of Ptolemy replaced by Copernicus and Newton, or the cosmos of positivism and modernity replaced by post-modernism. And at a more micro-level, in the discipline of anthropology, such shifts include the emergence and crisis in cultural evolution, followed by historical-particularism, followed by functionalism, followed by structuralism, followed by constructionism, followed by . . . . ?

Consider the current revolution occurring in the sciences as physics is challenged by modern [Quantum Physics](#) and [String Theory](#).