

Kuhn (1962) *Structure of Scientific Revolutions*

Radical alternative to Popper (Kuhn was a historian)

2 objections to Popper's account

1. Science does not gradually evolve towards the truth

2. Falsification is not the motor of scientific progress

Science is a calm, generally conservative activity, but is punctuated by violent revolutions

Paradigm

A set of practices that define a scientific discipline at any one time.

A shared framework that determines:

- a) What is observed
- b) What questions to ask
- c) How questions are asked
- d) How results are interpreted

Any discipline that works within a paradigm is scientific

Sociology and Psychology do not have a paradigm and are therefore **non-scientific**

Normal Science

A paradigm is agreed upon

Science is a **puzzle solving activity**. Scientists try to solve particular problems using a particular paradigm

Scientists are trained within a paradigm and are **perhaps even unaware that they are working within a paradigm.**

Anomalies occur. These are problems which the paradigm cannot solve. In normal science, **these problems are ignored.**

Normal Science soon encounters a period of crisis

Anomalies bring about a sense of profound professional uncertainty in the scientific community

1. Anomalies may be too numerous and cannot be ignored
2. Need for social change might make people more aware of the anomalies.

What happens in a crisis?

- Attempts to solve problems become increasingly radical and the rules of the paradigm are loosened.
- Eventually some scientists openly challenge the paradigm
- The crisis deepens when a new paradigm is suggested. The new paradigm is radically different. E.g. Pre-lavoisier chemistry needed a substance called phlogiston. Lavoisier abolished this. Einstein did the same with the ether
- Scientific “civil war” ensues

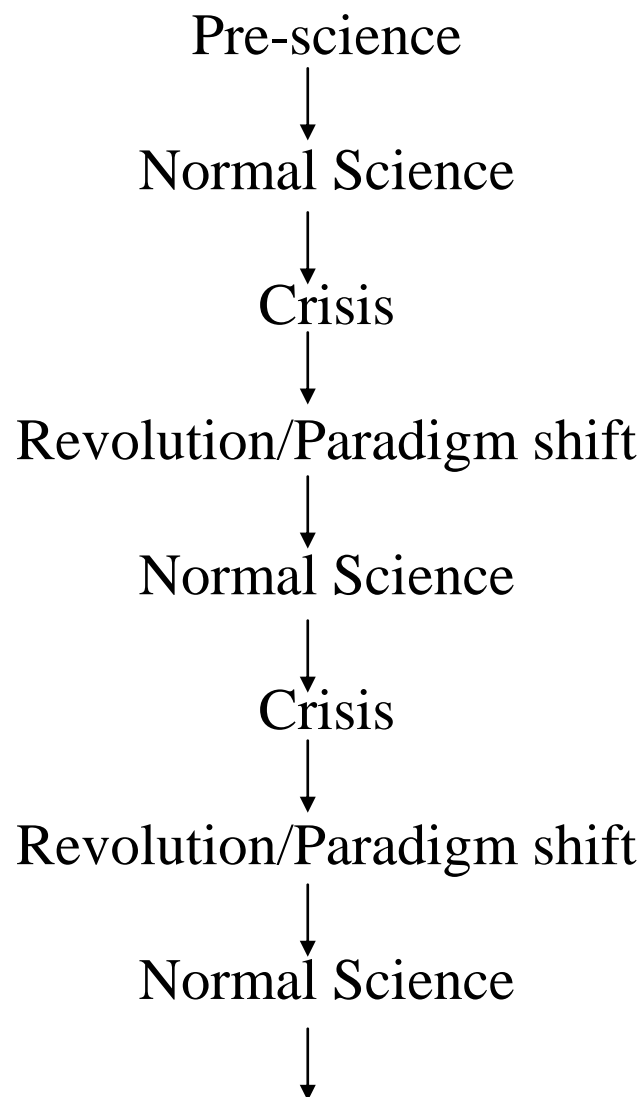
Why do scientists switch from one paradigm to another?

According to Kuhn, a “paradigm shift” is in some ways like a “Gestalt switch” or “religious conversion” and cannot be explained **entirely on the basis of logic or rationality**:

1. Different scientists are (psychologically) affected by different factors in their decisions about whether to adopt a new paradigm.
2. A paradigm presupposes metaphysical and epistemological perspectives from which other paradigms are inferior. (e.g., The world is deterministic. “Vital forces” exist in nature.)
3. Paradigm shifts do not occur because of a single convincing argument. Rather different arguments convince different scientists.
4. Arguments that scientists use in debating paradigms operate **mainly by *persuasion* rather than by logic or rationality**.
5. The choice between competing paradigms calls for a “decision between alternate ways of practicing science.”
6. The decision to accept a new paradigm is **often a matter of *faith***.
7. Scientists who resist paradigm shifts are not wrong or unreasonable. Rather, because of the changes in the conception of what science is that is associated with the new paradigm, they cease to be scientists.

Paradigms are therefore incommensurable – it is impossible to say that one paradigm is better than another.

Kuhn's Model of Science



It is important to note that science does not get progressively closer to the truth.

An Evaluation of Kuhn's ideas

Strengths

1. Kuhn's account does seem able to take the history of science into account in a way that Popper's theory could not.
2. The concept of a paradigm takes the theory dependence of observation into account. What scientists "see" is largely determined by the paradigm they are working in.
3. Scientists are seen as "humans" who are subject to influences from the outside world.

Weaknesses

1. Relativist tendencies. If there is no rational reason to switch paradigm, then how can we talk of scientific progress?

Kuhn rejected this, but it seems to follow from the claim that paradigms are incommensurable

This lowers the epistemological status of science

2. Can we speak of incommensurability? (Bhaskar). If I can say that 2 paradigms are incommensurable, then they are not incommensurable!
3. Kuhn gives us a descriptive account of science and not a prescriptive one. It does not tell us what scientists ought to do.