

# Philosophy of science

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ESS401 Social Science Methodology

22nd September 2015

# Outline

- Philosophy of science: what is it and why do we need it?
- Main debates in ontology and epistemology
- Positivism
- Interpretativism
- Realism

# Philosophy of science

- Philosophy explores fundamental basis of a given field.
- Philosophy of science:
  - (1) Questions which science cannot yet or perhaps cannot never answer.
  - (2) Why science cannot answer the first type questions?

# Philosophy of science: do we need it?

- *Philosophy of science is about as useful to scientists that ornithology is to birds.* (Richard Feynman)
- *There is no such thing as philosophy-free science; there is only science whose philosophical baggage is taken to board without examination.* (Daniel Dennett)

# Science: some definitions

- “The use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process.” (Charles Darwin)
- “The net of science covers the empirical universe: what is it made of (fact) and why does it work this way (theory).” (Stephen J. Gould)
- “Science alone of all the subjects contains within itself the lesson of the danger of belief in the infallibility of the greatest teachers in the preceding generation . . . As a matter of fact I can also define science another way: Science is the belief in the ignorance of experts.” (Richard Feynman)

# Science: problem of demarcation

- How does science differ from other knowledge systems?

# How science works?

- Karl Popper
- Falsification
- Scientific progress as a truth-approximation

# How science works?

- Thomas Kuhn
- Scientific revolution / paradigm (normal science)
- Scientific progress as a problem-solving



# How science works?

- Paul Feyerabend
- Epistemological / methodological anarchism
- Scientific progress as opportunistic “anything goes” strategy

# King, Keohane, Verba (1995)

- The goal is inference.
- The procedures are public.
- The conclusions are uncertain.
- The content is method.

# Philosophical basis of science

- Ontology
- Epistemology
- Axiology
- (Methodology)

# Ontology: main discussions

- Foundationalists vs. anti-foundationalists
- Materialists vs. idealists
- The agent vs. structure discussion

# Foundationalists vs. anti-foundationalists

- Foundationalists:
  - There is a real world “out there”, independent on our knowledge.
- Anti-foundationalists:
  - We live in multiple socially constructed worlds.

# Materialists vs. idealists

- Materialists:
  - All phenomena is ultimately made of matter.
  - Social world is driven by material forces.
- Idealists:
  - Reality is mentally/socially constructed.
  - Social world is driven by ideational forces.

# The agent vs. structure debate

- To what extent we are able to shape our lives against to what extent our lives are determined by external forces?
- Individualism:
  - Complex social phenomena can be explained on the basis of individual behavior.
- Structuralism (holism):
  - Social phenomena cannot be reduced to actor interactions, actors are determined by structures.

# Epistemology: main questions / discussions

- Can we identify real or objective relationships between social phenomena?
- Can we do this by direct observation or are there some relationships that exist but are not directly observable?
- Explanation vs. understanding?



# Positivism

- Foundationalism
  - Naturalism
  - Empiricism
  - Objectivism
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- Weaknesses?

# Interpretativism

- Anti-foundationalism
- Constructivism
- Rejection of objectivism
- Rejection of naturalism
  
- Weaknesses?

# Realism

- Foundationalism
- Dichotomy between reality and observed world
- Causal mechanisms vs. causal effects
  
- Weaknesses?

# Literature

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