

Scientific investigations: Logic or rhetoric?

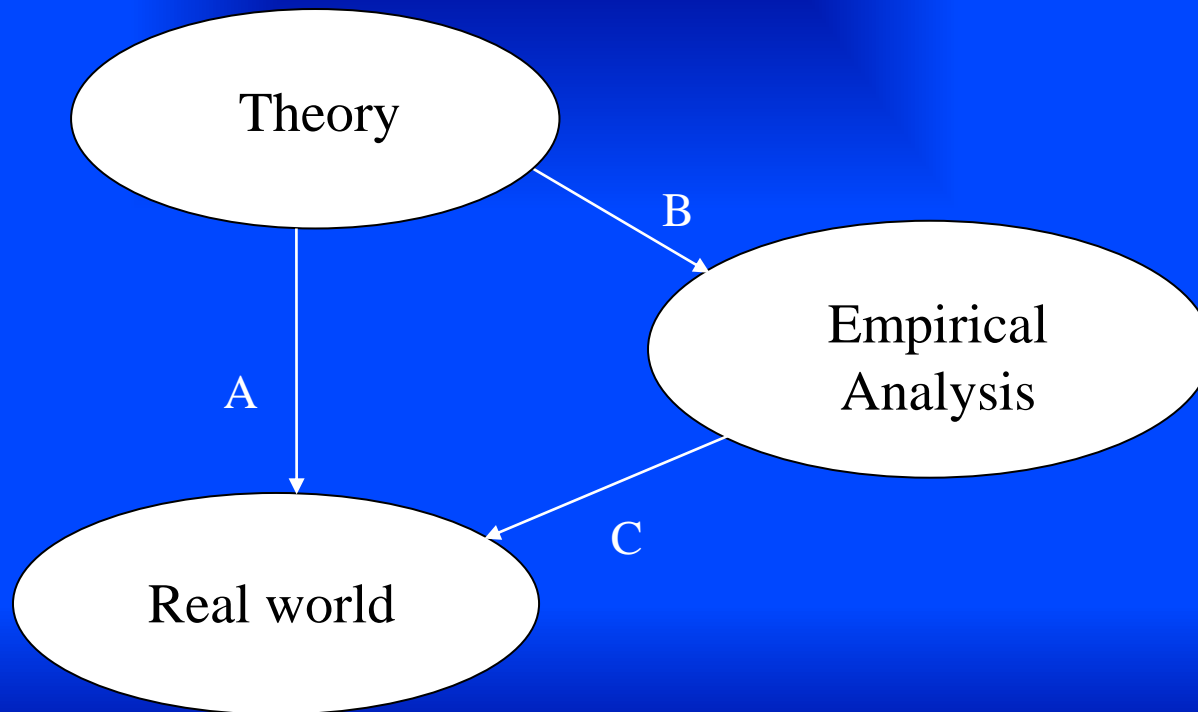
Stuart Birks
Massey University

ANZSASI, 11 June 2011

Logic and rhetoric

- Logic \Rightarrow proof
- Rhetoric \Rightarrow persuasion
 - Adam Smith on rhetoric
 - “Proof” in law is not proof
 - It is persuading a judge or jury
- How much analysis is rhetoric?

Theory and evidence



Analysis

- Much evidence
- Want a few conclusions
- Theories/models
 - main elements, basic relationships
 - “good” if explain much with little
 - inflated view of understanding?

Theory as analogy

- Paradigm (Kuhn)
- Analogy ('as if' alternative/simplified structure) or metaphor
- The blind men and the elephant
- Frame
 - use of selection, emphasis, exclusion, elaboration

What do we “know”?

- Choice of frames:
 - Galbraith (“conventional wisdom”)
 - Kuhn (“normal science”)
 - Hardin (“street-level epistemology”)
 - Also for “experts”
 - Bourdieu (“Fast thinkers”) and media soundbites

What do theories tell us?

- Data and consistency, Friedman:
“Observed facts are necessarily finite in number; possible hypotheses infinite.
If there is one hypothesis that is consistent with the available evidence, there are always an infinite number that are.”
So a significant result does not give the only possible explanation.

“Cause” and INUS conditions?

- Insufficient but
- Necessary part of an
- Unnecessary but
- Sufficient set of conditions

In summary, we:

1. Read a lot into simplified analyses;
2. Assume, by analogy, that structures apply to the real world;
3. Treat apparently plausible explanations as if they are the only explanations;
4. Accept many commonly held views as if well-founded.

And then we use flawed techniques and reasoning
(but that's another story)

Scientific investigations: Logic or rhetoric?

Stuart Birks
Massey University

ANZSASI, 11 June 2011