

Logic of Science

Harry Ganzeboom

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Babbie

- Babbie is an introductory text – one cannot expect a full and advanced discussion of logic of science.
- Babbie seeks a wide audience and his way to do this is to satisfy all (& sell his book...).
- Babbie is still very interesting to study on the choice of topics and positions.

Idiographic and nomothetic explanations (1)

- The contrast between idiographic and nomothetic explanations derives from the “Erste Methodenstreit [in der Deutsche Soziologie]” (late 19th century) (between historians and economists).
- To me, the two modes of explanation just seem to be two sides of the coin and not contrasting at all. Both are varieties of the “covering law model” of scientific explanation [Hempel], that Babbie introduces adequately in “Elements of Social Theory”.
- An important point to see is that there is no compelling logic in idiographic accounts – the “because” arguments are incomplete in the sense that they lack a rule (lawlike relation).

Idiographic and nomothetic explanations (2)

- So, idiographic explanations lack the general laws or regularities that nomothetic explanation seem to concentrate on.
- Likewise, nomothetic explanations would be without content if they did not refer to empirical instances (cases).
- Much of the confusion arises because many social scientists feel uncomfortable with the idea of general principle that would govern human behavior – they see no lawlike relationships in societies.

“Elements of social theory”

- Theories are systematic sets of interrelated statements intended to explain some aspect of social life.
 - Lawlike relationships: universal regularities
 - Concepts / variables
 - Propositions → hypothesis / expectation.

Lawlike relationships (1)

- Many social scientists feel uncomfortable with the idea of universal laws operating in the social world.
- Nevertheless, we all use overwhelmingly one single set of covering laws, both in science and in every day life: cost-benefit theory (in its various forms) [economic paradigm].
- Unlike economists and psychologists, social scientists seem to be quite happy with rather informal formulations of cost-benefit theories.

Lawlike relationships (2)

- Maybe you would feel more comfortable with the idea of lawlike relationships, if you realize that:
 - ... general propositions are quite empty without auxiliary hypotheses.
 - ... general propositions can probabilistic and multivariate
 - ... general propositions are not so much tested in research, but applied to derive an explanation.

Explanation

- Babbie is not very clear on how theories are systematic and how their elements interrelate.
- But this is easy to fill in: theories are arguments, in which the hypothesis to be tested is logically compelling deduced from two statements:
 - The general law proposition
 - The auxiliary assumption
- Unlike Babbie states, there is no ‘certainty’ that either of these ones is true. In fact, one way to see the whole operation is that it is about testing the truth.

The falsification principle

- An element that is dearly missing in Babbie's discussion, is the principle of falsification (Popper): if we are dealing with general (universal) proposition, we can never be certain that they are true. However, when we test them empirically we can find out that they are not true (or have not stood up to test).
- General propositions can be judged by the degree they have been tested and by the degree by which they have withstood critical tests (corroborated), but their truth can never be ascertained.

Falsification versus abolished

- Many people see no difference between falsification and abolishment of a general proposition, but there is.
- We only should give up on a general proposition, if we have a better one.
- Science progresses through the comparison of theories, not by the confrontation of theory and empirical findings.

Paradigms

- Babbie discusses a great (and growing) number of ‘paradigms’, these are collections of mindsets, programmatic statements, research designs, hypotheses, research subjects and various other things.
- ‘Paradigms’ alludes to Kuhn’s Structure of Scientific Revolution’, that argues that progress in science is indeed sometime revolutionary (change of mindset), and not evolutionary (gradually improving scientific knowledge).
- Observe that for Kuhn paradigms would still refer to theories with covering laws and that one paradigm replaces another in scientific history. This does not seem to be the case for Babbie.

Induction versus deduction

- Babbie subscribes to the ‘empirical cycle’ model of enquiry (“wheel of science”), in which induction (theory development) takes turns with deduction (theory testing or theory application).
- This is fine (and quite common), but misses crucial points:
 - Induction is not a logical operation, deduction is.
 - The truth of theories is not dependent on how they were conceived, who conceived them or under what circumstances.
 - There are many other ways in which you can conceive theories and explanations – and the best one is to build upon previous ideas and research.
- My favourite part on this in Babbie is the ludicrous description of Takeuchi’s inductive ‘discovery’ of “social constraints” theory.

Science as evolution

- In Popper's view science is "Objective Knowledge", that arises through an evolutionary process.
- Testing truth of theories is like survival of the fittest in biological evolution.
- Each new development builds on top of the old one. This is a gradual (piecemeal) process, but occasionally a more dramatic change occurs.
- Progress occurs through competition of (informative) ideas.

The existing body of literature

- The evolutionary model of science implies important methodological rules:
 - Your research should build upon previous literature. This may be by expanding, further test, criticizing it.
 - Any research (proposal) should contain or refer to an up-to-date and state-of-the-art literature review.
 - It is good to construct the previous literature as a competition of informative ideas. Having competing theories also repairs a major problem with naïve falsification: empty hands.