How I Know What I Know About the Web

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Science by Induction

- Idea: infer from empirical evidence to theory
- J.S. Mill - Methods
- Carl Hempel - D-N Model
- Problems:
  - The problem of induction
  - Problem of confirmation

Science by testing

- Karl Popper - Falsification
- H-D Model
  - Use induction to generate theories
  - Use theories to make predictions
  - Test predictions by experiment
- Problems
  - Of induction, again

Inductive Fallacies (1)

- Hasty Generalization: the sample is too small to support an inductive generalization about a population
- Unrepresentative Sample: the sample is unrepresentative of the sample as a whole

Inductive Fallacies (2)

- False Analogy: the two objects or events being compared are relevantly dissimilar
- Fallacy of Exclusion: evidence which would change the outcome of an inductive argument is excluded from consideration

http://www.fallacies.ca/induct.htm

Theory-Laden Data

- W.V.O. Quine - ‘Two Dogmas of Empiricism’
- The "Two Dogmas" are:
  - that there is a principled distinction between analytic and synthetic propositions
  - that reductionism is true

Paradigms

- Thomas Kuhn - scientific revolutions
- Paradigms:
  - Characterized by ‘normal science’
  - Challenged only after a body of counter-evidence is accumulated
  - Are *incommensurable* with each other

Problems

- Larry Laudan - *Progress and its Problems*
  - *theories matter only insofar as they solve problems*
  - *Anomalies not a problem for theories that solve problems successfully*

Research Programmes

- Imre Lakatos - Proofs and Refutations
  - A theory is actually a set of propositions that share a common idea
- A progressive research programme
  - is characterize by its growth
  - discovery of novel facts
  - development of new experimental techniques, better predictions

Scientific Explanations

- ‘Inference to the Best Explanation’
- AKA ‘abduction’ (B.F. Pierce)
- ‘Statistical Relevance’ (Wesley Salmon)
  - Given some class or population A, an attribute C will be statistically relevant to another attribute B if and only if $P(B|A.C) \neq P(B|A)$
- ‘Causal Mechanical’
  - A causal process is a physical process, like the movement of a baseball through space, that is characterized by the ability to transmit a mark in a continuous way.

http://plato.stanford.edu/entries/scientific-explanation/

Fallacies of Explanation (1)

- Subverted Support (The phenomenon being explained doesn't exist)
- Non-support (Evidence for the phenomenon being explained is biased)
- Untestability (The theory which explains cannot be tested)

Fallacies of Explanation (2)

- Limited Scope (The theory which explains can only explain one thing)
- Limited Depth (The theory which explains does not appeal to underlying causes)

http://www.fallacies.ca/explan_index.htm

Context

- A scientific explanation is “an answer to a ‘why’ question”
- Bas C. van Fraassen - “why X *instead of Y*”
  - What counts as an explanation depends on what expectations we had before
- Heidegger - asking a question: who we ask, what we expect in response

What We Believe

- Ludwig Wittgenstein - ‘meaning is use’ - as a scientific theory: ‘what we believe is revealed in our actions’
- Jacques Derrida - deconstruction - what we believe is revealed in our language
- (For example: consider the possibilities of ‘self’ in space and time)

Complexity

- Newtonian theories - one thing causes another causes another (billiard balls)
- *Complex* systems - multiple mutually dependent variables
- *Massively Complex*: when the variables involved exceed the symbol system used to describe them

Signs and Traces

- “We predict the future, as we interpret the past, from the signs it generates”
- Derrida - ‘traces’
  - in the present, I remember the recent past and I anticipate what is about to happen
  - The basis of experience is repeatability
  - But the sign, the trace, is in the difference, the unrepeated, the new

Personal Knowledge

- Michael Polanyi - Personal Knowledge
  - Knowing ‘that’ vs knowing ‘how’
  - Knowledge as a skill, like riding a bicycle
  - Tacit Knowledge:
    - Is personal, in the sense that it results from a *personal* context
    - Is *ineffable*, in the sense that it cannot be expressed in words

Non-Linguistic Grammar

- Susan E. Metros
  - 21st century literacies
  - Eg. Ways of knowing, understand cultures

    http://net.educause.edu/upload/presentations/MWRC08/GS01/Metros%20EDUCAUSE%20Midwest.pdf
  - Visual Literacy

    http://connect.educause.edu/Library/EDUCAUSE+Review/VisualLiteracyAnInstituti/40635
- Post-literate Vocabulary
  - The language of blogs, lolcats, videos, social networks and all the rest

Participation Research

- Builds on action research
- revolves around:
  - individuals within communities and groups,
  - relations between groups and communities
  - relations between people and environment
- Paulo Friere
  - “The silenced are not just incidental to the curiosity of the researcher but are the masters of inquiry into the underlying causes of the events in their world.”

Communities

- Method (if we can call it that)
  - Learning and discovery occur in communities (Etienne Wenger: communities of practice)
  - Nancy White - New technology creates new possibilities to create communities
  - The *community* is a sensory system, just like the mind

Build It And…

- Method (continued)
  - Build stuff, and see what happens
  - Corollory - have other people build stuff, and see what happens
- The key, here, is *how to see* what happens

How To See

- We are, recall, looking for signs and traces
- These signs and traces are patterns of connectivity
- ‘To know’ is to recognize patterns in the environment - where there is a pattern - a ‘trace’ there is agency

Patterns

- Patterns in a Network
- Paul Feyerabend - Against Method
- Semnantic Condition

Success (1)

- Success is, for the theorist just as surely for the hunter, to be able to find what one is looking for
- Success is *recognition* of phenomena, of patterns
  - Patterns that are useful for solving problems (like hunger)
  - Patterns that help us make predictions

Success (2)

- Do other people ‘see’ the same way I do?
  - Does my terminology resonate?
  - Do they form a community?
  - Do my ideas propagate through society?
- Not ‘popularity’ *per se* - more a question of network robustness