

Inductivity and Deductivity

The Scientific Method

- Select problem
- State theory
- Define terms
- Create testable hypothesis
- Operationalize variables
- Identify and sample population
- Conduct research
- Analyze data

Deductivity and Inductivity

- Popper's hypothetico-deductive model
 - Falsifiability
 - Confirmation and disconfirmation
 - Critical experiments
 - Evaluating scientific theories
- Sidman's case for inductivity
 - The weakness of pure deductivity
 - The value of scientific results
 - Pathway to knowledge

McGuire's Synthetic Epistemology

- All theories are true
 - The trick is to find a theory's limiting conditions or points where it comes into conflict with alternative theories
- Teaching induction
 - Techniques
 - Take a common “folk wisdom” and searching for conditions under which it does not hold true (counter-intuitive findings)
 - Take a scientific finding and reverse the direction of causality.

Critiques of the Hypothesis-testing Approach

- Significance tests versus power and effect size analysis
- Simon: Experimentation versus modeling
- Post-modern/deconstructionist critiques
 - “Truth” is subjective and arbitrary, not objective and rational
 - Problems, theories, and research questions reflect personal and ideological predispositions.
 - Social science as history (Gergen)

Hypotheses

- Definition: a predicted relationship among two or more variables.
- Null hypothesis: an expectation of no relationship among variables.
- Scientific hypothesis: an expectation of some reliable relationship among variables.
- Directional hypothesis: an expectation that differences in levels of one variable are associated with a positive (or negative) change in the level of another variable.
 - Monotonic
 - Linear
 - Nonlinear
 - Moderated