

## Introduction

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- **Context:** Challenges the traditional distinction between observation and experiment in philosophy of science.
- **Thesis:** Argues against the epistemic superiority of experiments over observations.
- **Proposal:** Focus on features that crosscut the distinction to better understand scientific methodology.

## Traditional View

- **Historical Definitions: Herschel:** Observation is passive; experiment is active manipulation.
- **Contemporary Debates:**
  - **Hacking:** Experiments create phenomena; observations detect.
  - **Gooding & Malik:** No clear distinction; both involve interaction.
  - **Perović:** Continuum of manipulability.
- **Currie and Levy:** Emphasize control as key to experiments' epistemic privilege.

## Arguments for Epistemic Superiority

- **Definition (ES):** Superior methods discriminate between more hypotheses.
- **Theses:**
  - **Strong Control:** Only experiments allow fine-grained control.
  - **Strong Causation:** Only experiments allow causal inferences.
- **Weaker Forms:**
  - **CP Control:** Experiments generally allow better control.
  - **CP Causation:** Experiments generally allow better causal inferences.
- **Critique:** Physical manipulation is neither necessary nor sufficient for fine-grained control or causal inference.

## CP Arguments for Epistemic Superiority of Experiment

- **Practical Superiority of Observation:** Example: Dian Fossey's gorilla studies.
- **Confirmatory Power:**
  - **Currie and Levy:** Control leads to better data.
  - **Okasha:** Organized observation can mimic experiments.
  - **Woodward:** Dependency structures in data.
- **Frequency and CP Claims:**
  - Need thorough accounting of natural processes.
  - Ideal experiments vs. ideal observations.
- **Randomization:**
  - RCTs control confounders through random assignment.
  - Observational methods can achieve similar benefits.
- **Causal Inference and Counterfactuals: Spirtes et al.:** Observational methods can outperform experiments.

## What Does Make Empirical Methods Epistemically Superior

- **Alternative Features:**
  - **Signal Clarity:** Sensitivity and noise reduction.
  - **Characterization of Backgrounds:** Identifying and subtracting irrelevant features.
  - **Discrimination and Variability of Precipitating Conditions:** Understanding conditions that produce signals.
- **Relation to Observation/Experiment Distinction:**
  - Features crosscut the distinction.
  - Physical manipulation is a red herring.
- **Philosophical Payoffs:**
  - Avoids dismissing observational fields. || Provides deeper understanding of contextual parameters.

## Concluding Remarks

- **Arguments Against Epistemic Superiority of Experiment:**
  - Physical manipulation is not necessary for fine-grained control or causal knowledge.
  - Nuanced arguments fail to support a general claim to epistemic superiority.
- **Shift in Focus:**
  - From observation/experiment distinction to more fine-grained features.
  - More informative for the epistemology of empirical research.