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.