

Research Synthesis and Decision Making

April 15

Outline

- New Material
 - Aggregating results (meta-analysis)
 - Decision making from experiments
- Review of course
- Discuss exam

Meta-analysis

- We rarely care about the results of individual studies
 1. Measurement error
 2. Under-powered designs
 3. Limited external validity (SUTO)
- Meta-analysis is the quantitative synthesis (aggregation) of experimental findings

Meta-analysis

Conducting a meta-analysis involves the following:

1. Identifying a research question
2. Establishing procedures for identifying studies on that question
3. Finding studies (published and unpublished)
 - This is to reduce "file drawer" problems
4. Convert published results into a standardized effect measure
5. Code studies for features (SUTO)
6. Regression study-specific effect sizes on study

Meta-analysis

- Common effect size measures:
 1. Standardized mean difference
 2. R^2
 3. Standardized β
- All depend on variation in the sample outcome

Meta-analysis

- Fully randomized experiments can only tell us about the ATE
- Blocked designs can additionally inform us about effect heterogeneity
- Meta-analysis lets us make inferences about heterogeneity from fully randomized designs

Meta-analysis

- Making decisions from single studies is tenuous
- Meta-analysis should be the basis for decision making
 - Weighted based on study power (sample size)
 - Less sensitive to external validity concerns (SUTO)
- Use meta-analytic effect estimates to design future studies

Decision making

- We do experiments to find out what works
- Typical focus is on direction/significance of effects
- We ultimately care about effect sizes
- We rarely consider trade-offs in effects

Decision making

- Trade-offs in outcomes
- Trade-offs in costs
- Treatment propensities
 - Combine $Pr(Treated|Assigned)$ with ATT
- Effect uncertainty
 - Measurement error
 - External validity (SUTO)

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Review

1. Fundamental problem of causal inference

Review

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2. Validity

Review

1. Fundamental problem of causal inference
2. Validity
3. Experimental Design

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Exam

1. Cover everything in the protocol

Exam

1. Cover everything in the protocol
2. Design and justify a budget

Exam

1. Cover everything in the protocol
2. Design and justify a budget
3. Focus on anticipating challenges and your strategies for addressing them

Rest of semester

- Work independently on exams
- Setup a meeting with me (via email) to check on the status