Reaching out to behavioral science audiences via meta-analysis

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Main idea

Meta-analysis is a widely used quantitative method in the behavioral sciences for synthesizing research and informing policy and interventions.

ASA Undergraduate Curriculum Guidelines emphasize:

- Data science and statistical computing
- Working with real data
- Diverse approaches to statistical models
- Communicating complex findings to laypeople
- Building relationships with allied disciplines

Meta-analysis incorporates these goals into a course or module learning experience.

Meta-analysis is a vehicle for statistics programs to intersect with behavioral science programs and audiences.

This poster presents the **learning goals**, **content modules**, and **types of assignments** in an undergraduate meta-analysis course.

Learning goals

What can students learn in a meta-analysis course or module?

1. **Issues around research synthesis and credibility**. The conceptual and statistical justifications for combining results across samples, and the role of meta-analysis in research credibility and reproducibility.
2. **Research literacy**.
   - Learn to read primary research for design and measurement details and effect size statistics.
   - Learn to do primary-study quality assessment.
   - Learn to read published meta-analytic reviews.
3. **Statistical methods and modeling**. Learn and use the statistical methods and models appropriate to meta-analysis.
4. **Disciplinary immersion**.
   - Do focused reading of primary disciplinary research around a research question.
   - Conduct a meta-analytic project in an area of disciplinary interest.
5. **Statistical computing**. Develop working knowledge of R packages and functions for meta-analysis.

Content modules

What can be taught in a meta-analysis course?

Library research tools

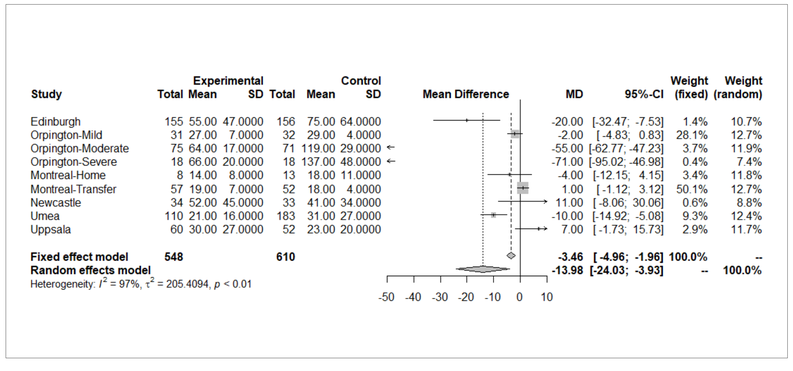
- Databases and search tools for study search and retrieval
- Study quality assessment tools

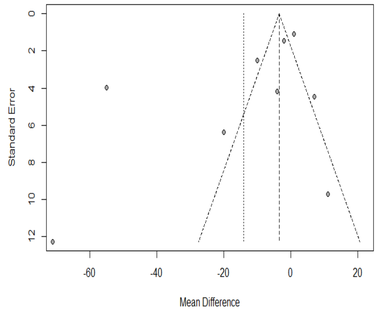
Effect size statistics and their standard error estimates

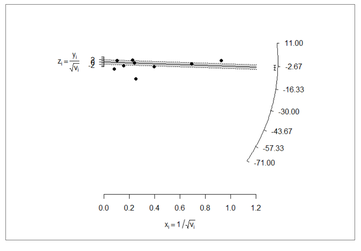
- SMDs
- OR/RR
- Correlation coefficients

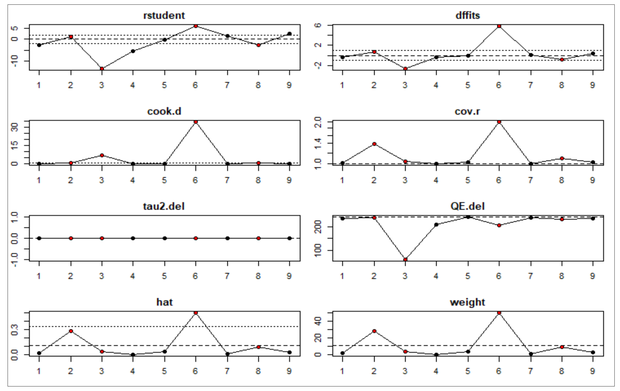
Meta-analytic statistics and methods

- Fixed/random/mixed effects models
- Heterogeneity statistics
- Meta-regression
- Bias and sensitivity analyses
- Graphical tools for meta-analysis









Assignments

What can students do in a meta-analysis course?

Data analytic assignments

- Work with effect size statistics
- Fit and evaluate meta-analytic models
- Meta-regression with quantitative and categorical predictors

Literacy assignments

- PICO, database, and search exercises
- Scraping design and treatment effect data from primary studies.
- Summarize a meta-analytic review
- Assessing primary study quality with Cochrane Collaboration assessment tool

Disciplinary research assignments

- Assignments comprising a meta-analytic project on a disciplinary question of interest