PSY 653 Module 10: Meta-Analyses and Missing Data Techniques

Part 1: Meta-Analyses

The file “studies2.csv” includes the outcomes of 25 studies where a particular test was correlated with a standard measure of academic achievement. The file includes the correlation, N, and a study designator (S1, S2..)

1. Download the “studies2.csv” dataset from the module 10 lab module on Canvas
2. Create a new R notebook from your project file and name it “Meta-Analysis Notebook”
3. Create a first level header: “Load Libraries”
    a. In a new R chunk load in the meta, psych & tidyverse packages.
4. Create a first level header: “Import Data”
    a. Read in the “studies2.csv” data.
5. Use the metacor() function to perform a meta-analysis across the 25 studies.
    a. What conclusions do you reach?
6. Use the forest() function to create a forest plot of your studies
    a. What does the forest plot tell you about the studies in your meta analysis?
7. Use the funnel() function to create a funnel plot of your studies
    a. What does this funnel plot tell you about the studies in your meta analysis?

Part 2: Handling Missing Data

1. Download the “mice_data2.csv” dataset from the module 10 lab module on Canvas
2. Create a new R notebook from your project file and name it “Missing data Notebook”
3. Create a first level header: “Load Libraries”
    a. In a new R chunk load in the mice, psych, olsrr & tidyverse packages.
4. Create a first level header: “Import Data”
    a. Read in the “mice_data2.csv” data.
5. Conduct a simple linear regression in which X1 is regressed on X2, X3, and X4. This uses pairwise deletion of missing values by default
6. Using the mice() function, impute the dataset 5 times
7. Using the with() function, perform a simple linear regression on the five imputed versions of the dataset in which X1 is regressed on X2, X3, and X4
    a. Examine how the model estimates vary across imputed versions of the dataset
8. Using the pool() function, calculate the pooled model estimates for the linear model
    a. How does the pooled regression estimate differ from that of the original model that used pairwise deletion?