

Supplementary Materials for:

“Enriching Meta-analytic Models of Summary Data by Considering Hierarchical Models of Individual-level Data: A Case Study”

Overview

In addition to this document, these supplementary materials contain the data files and script files listed below:

Data:

- *country.lat.long.csv*
- *study.data.csv*
- *study.data.mlmmvmeta.website.xlsx*
- *study.data.spmeta.website.xlsx*

Scripts:

- *step1.create.data.R*
- *step2.analyze.data.R*

We describe the R scripts and provide notes on how to use the two websites discussed in the manuscript to reproduce the summary data results of the case study. Because all summary data and individual-level data results in the case study (i.e., Tables 2-8 of the manuscript) can be reproduced using *step2.analyze.data.R* in conjunction with *country.lat.long.csv* and *study.data.csv*, these websites are not necessary to reproduce the results in the case study.

R Scripts

step1.create.data.R: This script creates the *study.data.csv* file. It requires two input files which can be obtained at the links provided within the script. Because the *study.data.csv* file is included in the supplementary materials, this script is not necessary to reproduce the results in the case study.

step2.analyze.data.R: This script reproduces all summary data and individual-level data results in the case study (i.e., Tables 2-8 of the manuscript). It requires two input files (*country.lat.long.csv* and *study.data.csv*) which are included in the supplementary materials.

SPMeta Website

<https://blakemcshane.shinyapps.io/spmeta/>

The *study.data.spmeta.website.xlsx* file contains summary data and website instructions for reproducing the summary data results in Parts I-III of the case study (i.e., Tables 2-5 of the manuscript). See also the website tutorial available at the website.

This website does not accommodate more than one dependent measure or study-level covariates and so is not capable of reproducing the summary data results in Parts IV and V of the case study (i.e., Tables 6-8 of the manuscript).

Note: The website requires input data to be given in the form of mean, standard deviation, and sample size of each study condition. However, the website makes use of only the standard error

of the mean (or effect size) which it obtains by dividing the standard deviation by the square root of the sample size. Hence, for the Summary I-II analyses of Part II of the case study (i.e., Table 3) where there is a contrast between study conditions rather than one or more study conditions, we supply the standard error directly as the standard deviation and simply set the same size to one.

MLMVMeta Website

<https://blakemcshane.shinyapps.io/mlmvmeta/>

The *study.data.mlmvmeta.website.xlsx* file contains summary data for reproducing the summary data results in the case study (i.e., Tables 2-8 of the manuscript).

To reproduce the results for Parts I-IV:

[1] Export the relevant worksheet as a csv file.

[2] Upload the csv file as the main input data, ignore the option to upload the error variance covariance matrix, and click the “Click to Estimate” button.

[3] Click the Results tab and click the “Download results (.Rdata)” link to download the results file.

[4] Load the file and obtain the estimates by executing the following code in R:

```
load('results.Rdata')
estimates$MMCSS$'No Constraints'
```

To reproduce the results for Part V:

[1] Export the Part5 and Part5.VCV worksheets as csv files.

[2] Upload the first csv file as the main input data, upload the second csv file as the error variance covariance matrix, and click the “Click to Estimate” button.

Note: Before clicking the button, make sure the second csv file has fully uploaded by scrolling down and making sure you can see the error variance covariance matrix.

Note: This model takes a long time to estimate.

[3] Click the Results tab and click the “Download results (.Rdata)” link to download the results file.

[4] Load the file and obtain the estimates by executing the following code in R:

```
load('results.Rdata')
estimates$MMCSS$'No Constraints'
```