1 Manual Shiny application

This manual describes how to use the application that accompanies the paper "Replication of Cohen's d: quantifying evidence using the Bayes factor". The application was created in `Shiny` (Version 0.13.1).

2 Getting started

2.1 Requirements

1. **Install `R`:** Please install the latest version of `R` (https://www.r-project.org/).
2. **Install RStudio:** Please install the latest version of RStudio (https://www.rstudio.com/).

2.2 Data preparation

NOTE: It is only possible to calculate the evidence for effect size replication for the comparison of two group means.

1. **Create two separate data files.** One file should contain the data from the original study, while another file contains data from the replication study.
2. **File format.** The accepted file formats are tab- or space delimited .dat and .txt files.
3. **File and variable names.** Provide the data file and the variables within this file with names that contain only letters, numbers, and dashes. Avoid spaces and other symbols to avoid problems in data loading.
4. **Structure data.** The first row should contain the variable names (e.g. "Name of the DV", Group1, Group2). All other rows represent one independent case or observation. The first column should contain the value of the dependent variable, using a decimal point. The second and third column identify group membership. All cases or observations should belong to one group only. If a case belongs to the first group, the value in the second column should be 1 for this row. The value in column 3 should then be 0. If a case is a member of group 2, the value of the second column should equal 0, while the third column contains the value 1.

3 Run the application and quantify the evidence for effect size replication

3.1 Start the application

1. **Open RStudio.**

2. **Open the application files.** Open the files ui.R and server.R from the data archive. The files are located in the folder "Application". Do not move the files to another location.

3. **Set working directory to current folder.** Set the working directory to the source file location, via the menu Session - Set Working Directory - To Source File Location.

4. **Install Shiny.** In the console at the bottom of your screen, type `install.packages(''shiny'')` and hit enter. The package Shiny should now be installed. You only have to do this once.

5. **Install other required packages.** In the console at the bottom of your screen, type `install.packages(''name of the package'')` and replace name of the package by `datasets`, `mvtnorm`, and `xtable` subsequently. The packages will be installed. You only have to do this once.

6. **Run the application.** Click the small arrow next to "Run app" and select `Run External` (see Figure 1). Then click `Run app` to start the application. The application will open in the internet browser.

4 Use the application

1. **Load your data files.** Select the data files from your location.

2. **Select a value for ϕ.** Choose a value that represents a relevant difference in effect size. See the Master thesis manuscript for more details on how to select an appropriate value.

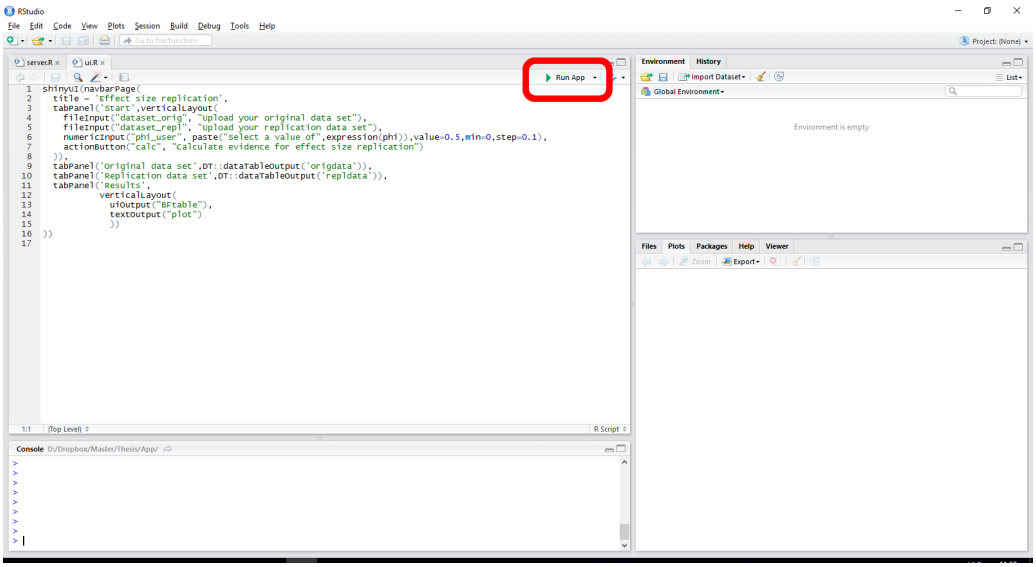

Figure 1: Starting the application.

3. **Check the data files.** Check if the data was loaded properly in the second and third tab. Make sure that the number of cases and corresponding values are correct.

4. **Quantify the evidence for effect size replication.** The final tab will present the resulting Bayes factors. It may take a while before the results appear, due to the computational processes that are executed. For interpretation of the resulting Bayes factors, please see the Master thesis manuscript.
   The results display a table with the Bayes factors BF_{12} and BF_{13} and a plot of the prior distributions on δ_{repl} that were used. Also some additional information regarding the settings is provided (number of iterations, burn-in, and value for ϕ).

5 Error messages

If the Results tab shows the error message "'file' must be a character string or connection", the data was not loaded yet. Please check that the data was loaded properly.