

Effect Size Explorer Technical Directions

This is a Shiny app for calculating effect size between two distributions. The user uploads a file containing data, selects two variables from the file, and the app calculates Cohen's d and Hedges' g effect size measures. It also displays a summary table and a density plot of the two variables.

About the Tool

This Effect Size Calculator is a [Shiny Web Application](#) developed by Matthew Courtney in 2023. It uses the [R statistical programming language](#) to read data off of a spreadsheet and create a summary of any column. The tool is hosted on the [shinyapps.io](https://www.shinyapps.io) server.

Preferred Citation

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https://www.freeanalyticstools.com/effect_size_explorer

Preparing your Data

1. Make sure your data is in a spreadsheet file format, such as .xls, .xlsx, or .csv.
2. Ensure that your spreadsheet file does not contain personally identifiable information or any other sensitive or confidential data.
3. Ensure that the column you want to analyze contains numerical data. If the column contains non-numerical data, such as text or dates, you will need to clean and prepare the data by converting it to numerical data.
4. Remove any empty cells or rows from your data to avoid errors during analysis.
5. Check for and remove any duplicates in your data to avoid skewing your analysis.
6. If your data contains missing values, decide how to handle them before analysis. One option is to remove any rows or cells with missing values. Another option is to fill in missing values with a reasonable estimate, such as the mean or median of the column.
7. If you have a large dataset, consider reducing the size of your data to improve the speed of analysis. You can do this by selecting a subset of the columns or rows in your dataset that are most relevant for your analysis.
8. Ensure that your data is accurate and reliable by validating the data before analysis. Check for errors and inconsistencies in your data, and correct any issues that you find.
9. Finally, when uploading your data into the tool, make sure to select the correct file and column to analyze. Double-check the data to ensure that you have selected the right file and column, and that the data is clean and prepared for analysis.

Using the Effect Size Calculator

1. Upload your data file by clicking the "Choose file to upload" button. The app supports files in .xlsx, .xls, .csv, and .tsv formats.
2. Once your data file is uploaded, you can select the two variables that you want to compare using the dropdown menus labeled "Select first variable" and "Select second variable".
3. After you have selected the variables, the app will automatically calculate the summary table, which displays the mean, standard deviation, and count for each variable. If your data contains missing values, the app will automatically remove them before calculating the summary statistics.
4. The app will also calculate two effect size measures: Cohen's d and Hedges' g. Cohen's d is a standardized measure of the difference between two means, and Hedges' g is a modification of Cohen's d that corrects for bias in small sample sizes. The effect size measures are displayed as text outputs labeled "Effect size (Cohen's d)" and "Effect size (Hedges' g)", respectively.
5. The interpretation of effect size measures varies depending on the context of your research question, but in general, a larger effect size indicates a stronger relationship between the two variables. Cohen's d values of 0.2, 0.5, and 0.8 are commonly interpreted as small, medium, and large effect sizes, respectively. Similarly, Hedges' g values of 0.2, 0.5, and 0.8 are commonly interpreted as small, medium, and large effect sizes, respectively.
6. The app also displays a density plot of the two variables, with the distributions of the two variables plotted as overlaid histograms. The plot also shows vertical lines indicating the mean of each variable.
7. Once you have finished exploring your data, you can close the app by clicking the "stop" button in RStudio or by closing the app window.

References

- R: R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
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- effectsize: Daniel Lakens (2021). effectsize: Estimation of Effect Size and Confidence Intervals. R package version 0.4.5. <https://CRAN.R-project.org/package=effectsize>
- ggplot2: Hadley Wickham (2016). ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York. ISBN 978-3-319-24277-4, <https://ggplot2.tidyverse.org>.