

EFashiny: An User-Friendly Shiny Application for Exploratory Factor Analysis

Summary

EFashiny is an user-friendly web application for exploratory factor analysis (EFA) (David J. Bartholomew 2011). The objectives of EFashiny are to streamline the routine data analyses in EFA and to allow users to easily understand and interact with their data.

With graphical user interface (GUI) in an interactive shiny (Winston Chang 2017) framework (Figure 1), EFashiny provides a step by step analysis flow to automate the procedure of EFA. A variety of approaches to manage, explore, analyze and visualize data is provided in EFashiny through wrapping together various R (Team 2000) packages, such as ggplot2 (Wickham 2016), psych (Revelle 2017), corrrplot (Wei 2017), and EGA (Hudson Golino 2017). EFashiny also allow users to estimate confidence intervals of factor loadings, thereby enhancing the functionality and practicality of the analyses. Finally, results of analysis in tables and graphs are all presented on-line and can be easily exported.

Key features of EFashiny include:

- An easy-to-use GUI to free users from R scripting
- A step by step analysis flow to easily and systematically perform EFA
- Quick data explorations with numeric summary and graphics
- Graphical and numerical factor retention methods
- Plenty of extraction and rotation methods
- Confidence intervals calculation of factor loadings
- Visualizations of factor loadings and Visualizations of correlation matrix
- Default arguments from recommendations in the previous literature (Robin K Henson 2006)
- Demonstrations using a typical item-level scale dataset

Our application is primarily aimed at behavioral science researchers who want to analyze and visualize datasets with a set of associated variables (e.g., item-level scale dataset) using EFA. It is also noted that EFashiny can be used to provide EFA-based connectivity analyses in neuroimaging data, such as event related potentials (ERPs) and functional near-infrared spectroscopy (fNIRS).

In conclusion, by using EFashiny, users can obtain insights into the data and the results of EFA without having worry about data processing or programming. Documentation, tutorials and usages can be found on **our page**.

References

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Figure 1: The GUI of EFashiny

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