# Turing Output of Item Response Theory Data Analysis into Graphs with R

Ching-Fan Sheu and Cheng-Te Chen

*Department of Psychology, National Chung Cheng University, Chia-Yi, Taiwan*

E-mail: psycfs@ccu.edu.tw

Item response theory (IRT) has become increasingly important for the analysis of measurement data in behavioral research. Many popular software packages for data analysis using IRT focus on parameter estimation and possess only crude graphical capability. However, graphical techniques have been widely recognized as essential tools for data analysis. Plotting enables researchers to gain insights into the relationship between variables, to assess outliers as well as to check model assumptions and so on. Within the framework of item response theory (IRT), person-item map, item characteristic curves (ICCs), and residual plots of fit statistics are three important graphical methods to examine how well the models fit the data and to aid in the interpretation of the features of these fitted models.

The purpose of this presentation is to illustrate the flexibility of using R to create high quality graphs in IRT data analysis. We will present two real data examples to illustrate the implementation of graphing person-item maps, item characteristic curves and residual plots in R.

## REFERENCES

1. Embretson, S.E., & Reise, S.P. (2000). *Item Response Theory for Psychologists*. New Jersey: Lawrence Erlbaum Associates, Inc.
2. Ihaka, R., & Gentleman, R. (1996). R: a language for data analysis and graphics. *Journal of Computational and Graphical Statistics*, 5, 299-314.
3. Venables, W.N., Smith, D.M., & the R Development Core Team (2003). *An Introduction to R. Notes on R: A Programming Environment for Data Analysis and Graphics* (Version 1.8.0).