R packages used

# R and RStudio

The quantitative methods and corresponding statistical tests were performed using R (version 3.4.2) while the actual programming was implemented via RStudio (version 1.1.453).

* R is an open source language and environment for statistical computing and graphics: <https://www.r-project.org/about.html>
* Frequently asked questions about R: <https://cran.r-project.org/doc/FAQ/R-FAQ.html>
* RStudio is an integrated development environment (IDE) for R that supports e.g. direct code execution, plotting and workspace management. It is available in open source and commercial editions <https://rstudio.com/products/rstudio/>

# Comprehensive R Archive Network (CRAN) and the packages utilized

All of the utilized packages were downloaded from Comprehensive R Archive Network (CRAN). See the comprehensive list for available packages <https://cran.r-project.org/web/packages/available_packages_by_name.html>.

The following, alphabetically ordered, list presents the packages used for specific statistical procedures. The CRAN pages contain for example the licensing information and help pages (e.g. vignettes). Note that several other packages were harnessed for producing diagrams, plots, and images.

`car´ – for factorial Analysis of variance (the main analysis)

* CRAN <https://cran.r-project.org/web/packages/car/index.html>
* Fox, J., & Weisberg, S. (2011). An {R} companion to applied regression (2nd ed.). Thousand Oaks CA: Sage. Retrieved from <https://socialsciences.mcmaster.ca/jfox/Books/Companion/>.

`emmeans´ – for Post hoc tests

* CRAN <https://cran.r-project.org/web/packages/emmeans/index.html>
* Lenth, R., Singmann, H., Love, J., Buerkner, P., & Herve, M. (2018). Emmeans: Estimated marginal means, aka least-squares means. R package version 1.2.1 [Software] Retrieved from <https://cran.r-project.org/web/packages/emmeans/index.html>.

`mice` – for 1) numerically explore the structure of missing values, 2) multiple imputation

* CRAN <https://cran.r-project.org/web/packages/mice/index.html>
* van Buuren S, Groothuis-Oudshoorn K (2011). “mice: Multivariate Imputation by Chained Equations in R.” Journal of Statistical Software, 45(3), 1-67. Retrieved from <https://www.jstatsoft.org/v45/i03/>.

`psych` – for 1) examining the descriptive statistics, 2) conducting the Exploratory factor analysis (EFA) including Parallel analysis, and 3) Reliability analysis for mean composite scores.

* CRAN <https://cran.r-project.org/web/packages/psych/index.html>
* Revelle, W. (2018b). Psych: Procedures for personality and psychological research (R pack-age version 1.8.3).

`tidyLPA` – for Latent profile analysis

* CRAN <https://cran.r-project.org/web/packages/tidyLPA/index.html>
* Rosenberg JM, Beymer PN, Anderson DJ, Van Lissa CJ, Schmidt JA (2018). “tidyLPA: An R Package to Easily Carry Out Latent Profile Analysis (LPA) Using Open-Source or Commercial Software.” Journal of Open Source Software, 3(30), 978. doi: 10.21105/joss.00978. Retrieved from <http://joss.theoj.org/papers/10.21105/joss.00978>.

`Sjstats` – calculating effect sizes for factorial Analysis of Variance (𝑝𝑎𝑟𝑡𝑖𝑎𝑙 𝜂2)

* CRAN <https://cran.r-project.org/web/packages/sjstats/index.html>
* Lüdecke, D. (2019). Sjstats: Statistical functions for regression models (version 0.17.3) doi:10.5281/zenodo.1284472 Retrieved from <https://CRAN.R-project.org/pack-age=sjstats>.

`VIM` – for visualizing the structure of missing values

* CRAN <https://cran.r-project.org/web/packages/VIM/index.html>
* Kowarik, A., & Templ, M. (2016). Imputation with the R package VIM. Journal of Statistical Software, 74(7), 1-16. doi:10.18637/jss.v074.i07.

`qgraph` – for visualization (Figure 1)

* CRAN <https://cran.r-project.org/web/packages/qgraph/index.html>
* Epskamp, S, Cramer, A. O. J., Waldorp , L. J., Schmittmann, V. D., & Borsboom, D. (2012). Qgraph: Network visualizations of relationships in psychometric data. Journal of Statistical Software, 48(4), 1–18.

`ggplot2` – for visualization (Figure 2)

* CRAN <https://cran.r-project.org/web/packages/ggplot2/index.html>
* Wickham H (2016). ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York. ISBN 978-3-319-24277-4