Power and Sample Size

The power and sample size methods taught in this one day workshop can be used for any organizational-related, or more generally, social science-related (e.g., educational research) application. We will cover statistical power and sample size computations for a variety of statistical models/designs such as ANOVA, regression, mediation, moderation, SEM, and multilevel. Issues related to a priori and a posteriori power analyses as well as the functions of sample and effect sizes will be covered. Statistical power computations will be illustrated via free software.

Cohen, J. (1992). Statistical power analysis. *Current directions in psychological science*, *1*(3), 98-101.

Ryan, T. (2013). *Sample Size Determination and Power*. Wiley.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods*, *39*(2), 175-191.

Schoemann, A. M., Boulton, A. J., & Short, S. D. (2017). Determining power and sample size for simple and complex mediation models. *Social Psychological and Personality Science*, *8*(4), 379-386.

Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: a 30-year review. *Journal of Applied Psychology*, *90*(1), 94.

McQuitty, S. (2004). Statistical power and structural equation models in business research. *Journal of Business Research*, *57*(2), 175-183.

Scherbaum, C. A., & Ferreter, J. M. (2009). Estimating statistical power and required sample sizes for organizational research using multilevel modeling. *Organizational Research Methods*, *12*(2), 347-367.

Latent Class and Latent Profile Analyses

Latent Class Analysis (LCA) and Latent Profile Analysis (LPA) are an intuitive and rigorous tools for uncovering hidden subgroups in a population. It can be viewed as a special kind of structural equation modeling in which the latent variables are categorical rather than continuous. Participants will receive an introduction to the essential topics of LCA/LPA such as: what are LCA/LPA, how to run models, how to choose between alternative models, how to classify observations, and how to evaluate and predict classifications. Modeling the basic LCA/LPA models will carried out with R.

Wang, M., & Hanges, P. J. (2011). Latent class procedures: Applications to organizational research. *Organizational Research Methods*, *14*(1), 24-31.

Hickendorff, M., Edelsbrunner, P. A., McMullen, J., Schneider, M., & Trezise, K. (2018). Informative tools for characterizing individual differences in learning: latent class, latent profile, and latent transition analysis. *Learning and Individual Differences*, *66*, 4-15.

Linzer, D. A., & Lewis, J. B. (2011). poLCA: An R package for polytomous variable latent class analysis. *Journal of Statistical Software*, *42*(10), 1-29.

Scrucca, L., Fop, M., Murphy, T. B., & Raftery, A. E. (2016). mclust 5: clustering, classification and density estimation using Gaussian finite mixture models. *The R journal*, *8*(1), 289.

Mediation and Moderation

Mediation analysis *is used to* understand *how* one variable affects another variable. Moderation analysis is used to understand *when or for whom* an effect is more or less likely to occur. This workshop will provide an introduction to mediation and moderation analyses using the PROCESS macro (Hayes, 2018) available for SPSS. The workshop will cover simple models involving a single mediator or moderator, and will end with more complex models involving multiple mediators and moderated-mediation. Topics will include continuous and categorical predictors, direct and indirect effects, bootstrapping, and confidence intervals. Participants should have a basic understanding of multiple regression. Prior experience with SPSS is helpful but not required.

Aguinis, H., Edwards, J. R., & Bradley, K. J. (2017). Improving our understanding of moderation and mediation in strategic management research. *Organizational Research Methods*, *20*(4), 665-685.

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.