

## Fall Course 2023

### „Exploring Meta-analysis: Methods and Practical Applications“

#### Course Schedule

Friday, 24<sup>th</sup> of November | Room B -102, Uni S, Schanzeneckstrasse 1, 3012 Bern

10:15 – 11:45 Talk + Discussion	<b>Introduction to Meta-Analytical Methods in R</b>  Prof. Dr. Susanne Bücken, University Witten/Herdecke, Germany
11:45 – 13:15 “Lunch with the Experts” (for registered PhD students only)	
13:15 – 16:00 Workshop	<b>Introduction to Meta-Analytic Structural Equation Modeling</b>  Prof. Dr. Suzanne Jak, University of Amsterdam, the Netherlands

This course is organized for Ph.D. students in the Doctoral Program Brain & Behavioral Sciences. For attendance of the whole day program (including preparing by reading the listed references), they are awarded with 2 ECTS. PhD students can register by completing the [Qualtrics](#) form until October 31, 2023. If other interested attendants would like to join the fall course, please contact our Doctoral Program Coordinator, [Madeleine Haenggli](#).

## Abstracts

Prof. Dr. Susanne Bücken, University Witten/Herdecke

### Introduction to Meta-Analytical Methods in R

How can meta-analytical methods assist us in navigating the flood of information in academic literature, underpowered individual studies, and contradictory or non-reproducible study results? This presentation introduces various meta-analytical methods and their implementation in R. It covers different types of meta-analyses and effect sizes (e.g., for correlational data, experimental studies, and longitudinal studies with mean comparisons), aiming to give listeners a conceptual understanding of which meta-analytical methods might suit their research topics and questions. Advice is provided on where and how to start a meta-analytical research project, how to conduct a systematic literature review and coding, and what challenges to be aware of. Additionally, specific R packages, such as "metafor" and "robumeta", are introduced with sample code to demonstrate their applications. The session concludes with shared "life hacks" related to meta-analyses, a discussion on typical reviewer comments on meta-analyses, and a look at the potential future directions of meta-analytic research.

#### References:

- Buecker, S., Stricker, J. & Schneider, M. (2023). Central questions about meta-analyses in psychological research: An annotated reading list. *Current Psychology*, 42, 6618–6628. <https://doi.org/10.1007/s12144-021-01957-4>
- Siddaway, A. P., Wood, A. M., & Hedges, L. V. (2018). How to do a systematic review: A best practice guide for conducting and reporting narrative reviews, meta-Analyses, and meta-syntheses. *Annual Review of Psychology*, 70(1), 747–770. <https://doi.org/10.1146/annurev-psych-010418-102803>
- Tanner-Smith, E. E., Tipton, E., & Polanin, J. R. (2016). Handling complex meta-analytic data structures using robust variance estimates: A tutorial in R. *Journal of Developmental and Life-Course Criminology*, 2(1), 85–112. <https://doi.org/10.1007/s40865-016-0026-5>

### Introduction to Meta-Analytic Structural Equation Modeling

Meta-analytic structural equation modeling (MASEM) refers to fitting structural equation models (such as path models or factor models) to meta-analytic data. The meta-analytic data generally consists of correlations across the variables in the path or factor model, obtained from multiple primary studies. The objective of this workshop is to learn the basics of MASEM and to get practical experience with fitting MASEM models using the dedicated online app webMASEM.

I will first contrast univariate MASEM to multivariate MASEM. Univariate MASEM refers to performing multiple univariate meta-analyses in order to obtain a synthesized correlation matrix as input in a SEM program. Multivariate MASEM in contrast involves using multivariate meta-analysis to synthesize correlation *matrices* across studies (e.g., GLS, TSSEM, one-stage MASEM). I will show that although univariate MASEM is the default MASEM method in for example organizational psychology, results obtained from univariate MASEM cannot be trusted.

The reason that univariate MASEM is still often used, may be that fitting MASEMs may be challenging for researchers that are not accustomed to working with R software and packages. Therefore, we developed webMASEM; a web application for MASEM. This app implements the one-stage MASEM approach, and allows users to apply multivariate MASEM in a user-friendly way. There are no prerequisites for this workshop.

#### References:

Jak, S., Li, H., Kolbe, L., de Jonge, H., & Cheung, M.W.-L. (2021). Meta-analytic structural equation modeling made easy: A tutorial and web application for one-stage MASEM. *Research Synthesis Methods*, 12, 590-606. <https://doi.org/10.1002/jrsm.1498>