Aktuelle Abschlussarbeiten

am Arbeitsbereich für Psychologie mit dem Schwerpunkt Quantitative Methodenlehre

Stand: 14.02.2025

Allgemeine Informationen

An unserem Arbeitsbereich werden regelmäßig Themen für Abschlussarbeiten ausgeschrieben. Darüber hinaus können nach Absprache auch eigene Themen im Bereich *Quantitative Methoden* bearbeitet werden.

Eine Liste der aktuell ausgeschriebenen Themen finden Sie auf den folgenden Seiten. Falls Sie Interesse an einem der Themen haben, schicken Sie bitte ein kurzes Exposé (max. 1 Seite) zum jeweiligen Thema und eine Kurzbeschreibung zu Ihrer Person an die in der Liste genannte Betreuer:in. Falls Sie ein eigenes Thema bearbeiten möchten, wenden Sie sich bitte mit einem konkreten Themenvorschlag (inkl. Exposé) an die Arbeitsbereichsleitung (simon.grund@uni-hamburg.de).

Bei allgemeinen Rückfragen wenden Sie sich bitte an das Sekretariat (sekretariat-grund.pb@uni-hamburg.de).

Hinweise zu Abschlussarbeiten

Mit der Anfertigung der Abschlussarbeit zeigen Studierende, dass sie eine Fragestellung aus einem Bereich der Psychologie nach wissenschaftlichen Kriterien bearbeiten und darstellen können.

Abschlussarbeiten im Bereich der Quantitativen Methoden beschäftigen sich mit der Entwicklung und Evaluation statistischer Verfahren für die psychologische Forschung, beispielsweise im Rahmen von Computer-Simulationen oder Fallstudien mit empirischen Daten. Die Abschlussarbeiten in unserem Arbeitsbereich werden in der Regel auf Englisch verfasst. Ausnahmen sind nach Absprache möglich.

Thema	**Effects of missing data on power and sample size calculations**
Art	1-2 Bachelorarbeiten
Betreuer:in	Prof. Dr. Simon Grund (simon.grund@uni-hamburg.de)
Beschreibung	Missing data are a common problem in psychological research that can distort results and reduce statistical power, if it is not adequately handled. However, despite the well-known effects of missing data, they are rarely considered when researchers perform power and sample size computations, resulting in target sample sizes that may be too small. The aim of this thesis (or theses) is to conduct a simulation study to explore the impact of missing data on power and sample size calculations for a common type of statistical analysis in psychological research (e.g., t-tests, regression, ANOVA).
Literatur	Newman, D. A. (2014). Missing data: Five practical guidelines. *Organizational Research Methods*, *17*, 372–411. https://doi.org/10.1177/1094428114548590 Davey, A., & Savla, J. (2009). Estimating statistical power with incomplete data. *Organizational Research Methods*, *12*, 320–346. https://doi.org/10.1177/1094428107300366

Thema	**Alternatives to repeated-measures ANOVA: A re-analysis of data from within-subjects experimental designs**
Art	1 Bachelorarbeit
Betreuer:in	Prof. Dr. Simon Grund (simon.grund@uni-hamburg.de)
Beschreibung	The repeated-measures ANOVA (RM-ANOVA) is one of the most common methods for analyzing data from within-subjects experimental designs. However, in recent years, there have been a number of recommendations for alternative methods, which include multilevel models (MLMs) with random effects and linear models with robust variance estimation (RVE) for clustered data. The aim of this thesis is to conduct a series of case studies that apply these methods to existing data from within-subjects designs and compare them with regards to their results and their conceptual and practical advantages and disadvantages.
Literatur	Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language, 68*, 255–278. https://doi.org/10.1016/j.jml.2012.11.001 Lee, Y. R., & Pustejovsky, J. E. (2024). Comparing random effects models, ordinary least squares, or fixed effects with cluster robust standard errors for cross-classified data. *Psychological Methods, 29*, 1084–1099. https://doi.org/10.1037/met0000538

Thema	**Repeated-measures ANOVA with incomplete data**
Art	1 Bachelorarbeit
Betreuer:in	Prof. Dr. Simon Grund (simon.grund@uni-hamburg.de)
Beschreibung	The repeated-measures ANOVA (RM-ANOVA) is often used to investigate mean changes over time. In studies with multiple measurements over time, there are often significant amounts of missing data that can distort the results of statistical analyses if they are not adequately handled. For this reason, it has been suggested that researchers should consider alternatives to RM-ANOVA, such as structural equation modeling (SEM) and multilevel modeling (MLM), which allow handling missing data through maximum likelihood estimation and similar methods. The aim of this thesis is to conduct a simulation study to evaluate how well these methods can deal with missing data in the context of the RM-ANOVA.
Literatur	Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language, 68*, 255–278. https://doi.org/10.1016/j.jml.2012.11.001 Langenberg, B., Helm, J. L., Günther, T., & Mayer, A. (2023). Understanding, testing, and relaxing sphericity of repeated measures ANOVA with manifest and latent variables using SEM. *Methodology, 19*, 60–95. https://doi.org/10.5964/meth.8415

Thema	**How many syntheses should be used when generating and analyzing synthetic data?**
Art	1 Masterarbeit
Betreuer:in	Prof. Dr. Simon Grund (simon.grund@uni-hamburg.de)
Beschreibung	Research in psychology has faced a credibility crisis, and “open data” is often considered an important step towards a more reproducible and credible psychological science. Unfortunately, data sharing is very rare. For this reason, it has been suggested that statistical methods such as synthetic data could be used to improve data sharing practices. Using this method, researchers can replace sensitive information with simulated values, resulting in copies of the data that can be shared more liberally and still allow other researchers to reproduce the findings of the original study. However, there are still many open questions about how synthetic data should best be generated and analyzed. The aim of this thesis is to conduct a simulation study that focuses on how the number of synthetic data sets affects the utility of the results obtained from synthetic data.
Literatur	Quintana, D. S. (2020). A synthetic dataset primer for the biobehavioural sciences to promote reproducibility and hypothesis generation. eLife, 9(e53275), 1–12. https://doi.org/10.7554/eLife.53275 Grund, S., Lüdtke, O., & Robitzsch, A. (2024). Using synthetic data to improve the reproducibility of statistical results in psychological research. Psychological Methods, 29, 789–806. https://doi.org/10.1037/met0000526

Thema	**Testing indirect effects in mediation analyses with incomplete data**
Art	1 Masterarbeit
Betreuer:in	Prof. Dr. Simon Grund (simon.grund@uni-hamburg.de)
Beschreibung	Mediation analyses are often used to investigate indirect effects, which are based on the idea that one variables' effect on a second variable is due, in part, to a third, intermittent variable. In practice, mediation analyses are often complicated by missing data, and many researchers address this problem with multiple imputation (MI) or similar methods. However, best-practice recommendations for estimating and testing indirect effects (e.g., the bootstrap) are difficult to apply in MI, and there are multiple strategies for combining them. The aim of this thesis is to conduct a simulation study to evaluate some of these strategies for testing indirect effects in MI.
Literatur	MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*, 99–128. https://doi.org/10.1207/s15327906mbr3901_4 Newman, D. A. (2014). Missing data: Five practical guidelines. *Organizational Research Methods*, *17*, 372–411. https://doi.org/10.1177/1094428114548590

Thema	**Small-sample corrections in multilevel modeling with multiply imputed data**
Art	1 Masterarbeit
Betreuer:in	Prof. Dr. Simon Grund (simon.grund@uni-hamburg.de)
Beschreibung	Psychological researchers often use multilevel modeling to analyze multilevel data, which are characterized by a hierarchical (e.g., with persons nested in groups). In these types of data, sample sizes are often small, and missing data are a common nuisance. For this reason, it is recommended that researchers handle the missing data with modern methods such as multiple imputation (MI) and use multilevel modeling with small-sample corrections. However, there are different strategies for combining these methods, and little is known about which strategy works best. The aim of this thesis is to conduct a simulation study to evaluate some of the possible strategies for conducting multilevel modeling in small samples with missing data.
Literatur	McNeish, D. (2017). Small sample methods for multilevel modeling: A colloquial elucidation of REML and the Kenward-Roger correction. *Multivariate Behavioral Research, 52*, 661–670. https://doi.org/10.1080/00273171.2017.1344538 McNeish, D. M. (2017). Missing data methods for arbitrary missingness with small samples. *Journal of Applied Statistics, 44*, 24–39. https://doi.org/10.1080/02664763.2016.1158246