

Overview on presentation contents

Experiment design, from research question to hypothesis

- Development of scientific questions
- Experiment design (main focus of presentation)
 - o Factors and factor levels
 - o Independent and dependent variables
 - o Independent vs. dependent groups
- Hypotheses (only quick repetition)
 - o H0 and H1
 - o Alpha- and beta error

Quality criteria, structure and content of scientific texts

- The three main quality criteria
 - o Definition
 - o Meaning
 - o Relationship to each other
- Short overview on other quality criteria
- Structure and content of scientific texts
 - o Short introduction to APA style basics (does not need to be very elaborate, you don't need to know APA style by heart)
 - o Typical structure and content of empirical research publications
 - o Plagiarism: Definition, Consequences, how to avoid

Standardized questionnaires and construction of a new questionnaire

- Definition of a standardized questionnaire
- Different types of tests
 - o Performance vs. aptitude
 - o Speed vs. Power
 - o Attitudes
 - o Personality
- Items and item construction
 - o Rules for constructing good items
 - o Open vs. closed format
 - o Quality control of a questionnaire (item analysis) (only short, will be handled in more detail in the summer semester)

SPSS introduction: Data input and import

- Importing data from Excel into SPSS
- Data view, variable view, syntax, output
- Generating new variables
- Defining missing values, labels, and missing values
- Non-parametric data in SPSS
- Staying in control: variable names and labels

Research methods: quantitative and qualitative, descriptive und inferential statistics

- Goals, when to use, advantages / disadvantages, limitations of:
 - o Qualitative research
 - o Quantitative research
 - o Descriptive statistics vs. inferential statistics
- Statistical significance
 - o p-value
 - o α level

Descriptive statistics and diagrams

- Frequencies
- Measures of central tendency
 - o Median
 - o Mode
 - o Mean
- Measures of dispersion
 - o Variance
 - o Standard deviation
- Types of diagrams and when to use them
- In SPSS (short)

Correlation and χ^2

- Calculation of correlations (+ assumptions), and when to use them
 - o Pearson
 - o Spearman
 - o In SPSS
- Correlation and causality
- Interpretation of the correlation coefficient (direction, size, significance)
- χ^2
 - o When to use
 - o In SPSS (short)

t-test for independent samples

- Assumptions
- When to use
- In SPSS (short)
- Alpha error inflation

ANOVA (between subjects design)

- Assumptions
- When to use
- In SPSS (short)
- On-way and two-way
- Main effects and interaction effects

t-test with dependent samples and repeated measures ANOVA (within subjects design), effect size

- Assumptions
- When to use
- In SPSS (short)
- Effect size
 - o Which measure for which test?
 - o Meaning and interpretation