

Berlin, 27. April 2021

Guidelines for Master Theses

Chair of Biological Psychology and Neuroergonomics

Requirements

- A) **Empirical vs. Methodical thesis vs literature reviews:** Different types of theses are possible. Empirical theses contain the process of experiment planning, data collection, and practical lab work, and receive assistance for data processing and feature extraction. Methodical theses use already collected data which makes the independent creation of the data processing pipelines the core of the thesis. All students have to create plots and compute statistics themselves as well as discuss the scientific background, data collection, data processing, statistics and results in their thesis work. Literature reviews require an exhaustive search and compression of existing literature regarding a specific research question and to extract new insights from the existing studies. It is not sufficient to simply summarize existing work.
- B) All master students have to submit a **written exposé** in German or English about their planned work to the department's secretariat and the supervisor. This should be max. 3 pages (incl. references) and contain the following points:
- Header:** Name, address, telephone number and email address, provisional title of the thesis, date of writing the exposé, and planned date of handing in the thesis.
- Background:** This should be a brief outline of the relevant research context and most important publications leading to this research question, including the gap that should be filled by the project in general.
- Research Questions:** This should contain a clear statement of the central issue to be solved in the thesis work. In addition, the specific research questions that are asked should be presented in more detail, and if applicable, associated with the hypothesized outcomes.
- Time plan:** Schedule for the preparation, implementation, evaluation and writing the work, including the final submission and whether or not this is a mandatory deadline or extendable.



- C) For master students, regular **participation in the colloquium** (usually in English) is compulsory and participation in the weekly team meeting is advised. Each Master student is encouraged to **present his or her own work at least twice**:
- Once in the **team meeting**, containing the study design, questions, hypothesis, and methodology before the study is conducted/before the data analysis is started. The purpose of this presentation is to receive feedback on the planned approach and to adapt accordingly where necessary. Changes to the experimental plan or the experimental setup should be discussed with the supervisors.
 - Once in the group **colloquial talks**, serving as a final presentation of the thesis after the work is finalized. In order to allow sufficient time for a discussion, the pure presentation time should not exceed 45 min. For the purpose of illustration, you are asked to prepare a slide presentation. This presentation can be a bonus/malus to influence the mark of the thesis in the end as part of the scientific presentation quality of the student.
 - Intermediate quick presentations and discussions in the weekly meetings are also possible in addition to the above described.

Study implementation

Before implementing any experiment, each Master's student should study the ethical principles of human research and take the online ethics course of the Canadian Panel on Research Ethics (<http://tcps2core.ca/welcome>). With this in mind, you are asked to closely examine your own study design again. If not already in place, a review of every experiment by the ethics committee is desirable, and obligatory for a scientific publication.

During the experimental phase, you are asked to **keep a test protocol**, which notes all special features (e.g. loss of test subjects, date of questionnaires returned, disturbances of the test procedure, etc.). Completed questionnaires and other tests are to be labeled (subject number, date, test section, etc.) and filed.

For laboratory tests: The use of the test rooms, equipment and consumable materials has to be done with the requisite care. After each single test, the collected data must be saved separate from the experimental control computers.

After completing the experiment, all documents must be removed from the test room. Unused questionnaires and other reusable materials should be handed to the secretariat. Data on test control computers and recording computers has to be deleted by the investigator (after storing it on the BPN server!).

Important! All files must be stored on the BPN data storage server!

Data preparation and analysis

All collected data must be transferred to an importable data file (R, MATLAB, SPSS). Variable names, codes, sequence of data, etc. are to be discussed with the supervisors. You are asked to create a backup of this file. All syntax and output, and all other data processing scripts used for further processing and analysis have to be saved on the BPN server; files with flawed data or incorrect analyzes should be deleted.

Writing the thesis

The written work should correspond to the standards of scientific texts. For formal design, the **guidelines** for manuscript design of the **American Psychological Association (APA)** should be consulted. A **line spacing of 1.2** and **one-sided printing** should be selected. The body of the thesis should contain **no more than 50 pages** including figures but not including the appendix.

The language of the written work is either **German or English** and an abstract in the other language must be included in the thesis. The content of the written work should contain an abstract, table of contents, list of abbreviations, and chapters oriented at the structure of introduction, background, methods, results, discussion. The thesis should also contain a clear statement of the research questions and the hypotheses.

An appendix to the work should include all questionnaires, instructions, recruitment texts and other materials used, as well as any results and statistical analysis not already contained in the text. For the appendix, a separate table of contents has to be provided.

Submission

At the examination office, **three** copies have to be submitted. Each copy additionally has to include a CD or USB drive containing:

- The thesis PDF file
- All created data processing, data visualization, and statistics scripts including documentation on their usage in a README file
- Final extracted data values that are used for the statistical analysis and plots

Additionally, it has to be ensured that all digital raw data (e.g. *.xdf files), stimulus material, programs used for controlling the experiment, files of the used questionnaires, instructions, recruitment texts, and all files of the provided CD/USB drive except the thesis PDF file are stored on the BPN server in a location that is made known to the supervisors.