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## Plan Overview

*A Data Management Plan created using DMPonline*

**Title:** Measuring cerebellar signals with electroencephalography

**Creator:** Jana Klaus

**Principal Investigator:** Jana Klaus

**Affiliation:** Utrecht University

**Funder:** Netherlands Organisation for Scientific Research (NWO)

**Template:** Data Management Plan NWO (September 2020)

**ORCID ID:** 0000-0003-4398-8672

### Project abstract:

Electroencephalography (EEG), the non-invasive measurement of electrical signal changes in the brain, was discovered 100 years ago. Despite countless methodological advances since, mapping the cerebellum has been largely neglected. The cerebellum is an important brain structure which is increasingly linked to functions like language and emotion processing as well as psychiatric disorders. This project will develop and validate methods to reliably measure EEG signals from the cerebellum in healthy individuals and patients with cerebellar conditions. Findings will benefit researchers and clinicians alike, and will contribute to our knowledge on the multifaceted role of the cerebellum in humans.

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# Measuring cerebellar signals with electroencephalography

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## General Information

### Name applicant and project number

Jana Klaus  
406.XS.24.02.131

### Name of data management support staff consulted during the preparation of this plan and date of consultation.

Ron Scholten - data manager at Faculty of Social and Behavioural Sciences, Utrecht University - 19/12/24  
Pascal Pas - privacy officer at Faculty of Social and Behavioural Sciences, Utrecht University - 15/11/24

## 1. What data will be collected or produced, and what existing data will be re-used?

### 1.1 Will you re-use existing data for this research?

If yes: explain which existing data you will re-use and under which terms of use.

- No

### 1.2 If new data will be produced: describe the data you expect your research will generate and the format and volumes to be collected or produced.

All collected experimental data will be numeric (EEG and reaction times). Consent forms will be digitized and stored as .pdf files.  
EEG data: raw data files in .bdf format (Biosemi default), further processed as .mat files (Matlab)  
Behavioural data: raw data files in .csv and .txt format, further processed as .RData files (R)

### 1.3. How much data storage will your project require in total?

- 100 - 1000 GB

## 2. What metadata and documentation will accompany the data?

### 2.1 Indicate what documentation will accompany the data.

The data will include project- and data-level documentation.  
Project-level documentation includes:

- Title, project ID, author(s) and contributor(s), institution involved, funder, grant number, when and where the data were collected, contact person for the dataset
- Keywords, subject area and abstract
- An explanation of the files and folders in the dataset
- Instruments and instrument settings, experimental protocol, target population and sampling methods, data cleaning and analysis workflow, scripts and tools used for data capture and analysis, pseudonymisation methods, quality assurance methods
- Data Management Plan, funding proposals, ethical applications, information letter to participants

Data-level documentation includes:

- A data dictionary explaining the measured variables
- A lab notebook documenting session-specific information
- A file overview sheet specifying subject ID, experimenter, data collection date and all associated files for this session

## **2.2 Indicate which metadata will be provided to help others identify and discover the data.**

Data will be stored on the Yoda server, so standard experiment data will be added there. Additionally, annotated experiment scripts (R and Matlab) and readme text files will be provided.

## **3. How will data and metadata be stored and backed up during the research?**

### **3.1 Describe where the data and metadata will be stored and backed up during the project.**

- Institution networked research storage

Our research uses the research data management system Yoda. Yoda facilitates collaboration on data during research, archiving of data during and after research, and publication of research data. Data along with its metadata is shared within a closed user group, accessible to authorized users. In Yoda, data can also be deposited in the Vault where it becomes read-only. Vaulted data can be published (findable and citable via DOI Datacite identifier) and as such can be made available to the research community at large.

### **3.2 How will data security and protection of sensitive data be taken care of during the research?**

- Not applicable (no sensitive data)

## **4. How will you handle issues regarding the processing of personal information and intellectual property rights and ownership?**

### **4.1 Will you process and/or store personal data during your project?**

**If yes, how will compliance with legislation and (institutional) regulation on personal data be ensured?**

- Yes

Personal data (names, email addresses) which can be linked back to an individual will only be stored during the participant recruitment phase, and will be destroyed immediately after data collection. These data will be password-protected and stored in a separate document and in a different file location than the collected data.

### **4.2 How will ownership of the data and intellectual property rights to the data be managed?**

The data will be owned by Utrecht University.

## **5. How and when will data be shared and preserved for the long term?**

### **5.1 How will data be selected for long-term preservation?**

- All data resulting from the project will be preserved for at least 10 years

The resulting data concern raw and preprocessed experimental data. No personal data will be stored.

**5.2 Are there any (legal, IP, privacy related, security related) reasons to restrict access to the data once made publicly available, to limit which data will be made publicly available, or to not make part of the data publicly available?**

**If yes, please explain.**

- No

All data will be anonymised, so there are no legal concerns with respect to data sharing.

**5.3 What data will be made available for re-use?**

- All data resulting from the project will be made available

Only anonymised numerical data (i.e., preprocessed EEG data, reaction times) will be made publicly available. It will not be possible to identify individual participants based on the publicly available data.

**5.4 When will the data be available for re-use, and for how long will the data be available?**

- Data available as soon as article is published

The accompanying paper will be published open access, and the data will be made available immediately upon publication.

**5.5 In which repository will the data be archived and made available for re-use, and under which license?**

Preprocessed data and accompanying analysis scripts will be archived and published directly in Yoda under a CC-BY-NC-SA license. After publication, the data is:

- Findable via its DOI and the associated metadata.
- Accessible either Publicly (downloadable for anyone) or under Restricted access with specified data access conditions.
- Interoperable as made certain by review of the data manager prior to publication.
- Reusable via an explicitly defined license that is part of the metadata.

**5.6 Describe your strategy for publishing the analysis software that will be generated in this project.**

Analysis will be done in R, which is open-source, and Matlab, which users need a licence for. This will be clearly indicated in the readme text files.

## **6. Data management costs**

**6.1 What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?**

Data management will be performed by the principal investigator and the research assistant who will get hired for this project. Storage space on the Yoda server is provided by Utrecht University.