**README: EEG data supporting the published article: Global motion evoked potentials in autistic and dyslexic children: a cross-syndrome approach**

**Ethical consent**

*ParentInfoConsent\_Combined.pdf*

Information sheet and blank consent form which was completed by parents/guardians of child participants.

**Demographics files:**

*demographics task1.csv*

*demographics task2.csv*

These files contain the demographics information for each of the participants included in the paper for the motion coherence task (*demographics task1.csv*) and the direction integration task (*demographics task2.csv)*. Each file contains the following variables for each participant:

|  |  |
| --- | --- |
| **Variable name** | **Description** |
| ID | Participant ID number |
| Group | Group membership. 1 = typically developing; 2 = autism; 3 = dyslexia |
| Age | Age at testing (in years) |
| Sex | Sex. 0 = male; 1 = female |
| WASI VIQ | Verbal IQ composite score, measured with the WASI-2 |
| WASI PIQ | Performance IQ composite score, measured with the WASI-2 |
| WASI FSIQ | Full-scale IQ composite score, measured with the WASI-2 |
| SCQ | Social Communication Questionnaire-Lifetime total score |
| ADOS total | Total score from the ADOS-2 (for children in the autism group only) |
| ADOS severity | Severity score from the ADOS-2 (for children in the autism group only) |
| WIAT-Spelling | Standard score from the spelling subtest of the WIAT-III |
| TOWRE-2 | Standard score from the Phonemic Decoding Efficiency subtest of the TOWRE-2 |
| Averaging WIAT and TOWRE-2 | Average of WIAT-Spelling and TOWRE-2 standard scores |
| Session1 | Which task the participant completed first (1 = motion coherence, 2 = direction integration) |

**EEG data:**

*EEGdata\_task1.zip*

*EEGdata\_task2.zip*

*/ Formatted\_PXXX\_taskX\_preproc.mat*

Zipped files contain the preprocessed EEG data for each participant for the motion coherence task (*EEGdata\_task1.zip)* and direction integration task (*EEGdata\_task2.zip)*. Within each zipped folder is a .mat file for each participant included in the dataset (*Formatted\_PXXX\_taskX\_preproc.mat)* where PXXX is the ID number listed in *demographics taskX.csv,* and taskX refers to the task (task1 = motion coherence task; task2 = direction integration task). Each file contains the following variables (most important variables listed first):

|  |  |
| --- | --- |
| **Variable name** | **Description** |
| X | 1 x N cell, where N is the number of trials (normally 152). Each cell contains a 128 x Z matrix, where 128 is the number of channels and Z is the number of samples in each trial. This is the data resulting from all preprocessing steps, used for the analysis (MOVEP\_analysis8\_DC.m, found at <https://osf.io/wmtpx/>). |
| Onsets | Structure with following fields:  Onsets.matrix: N x 6 matrix, where N is the number of trials, and the columns reflect each trial event (1: Fixation onset; 2: Random motion; 3: Photodiode signal at stimulus onset; 4: Stimulus; 5: Response; 6: Offset). Note that the timings were corrected relative to the photodiode signal, so column 3 = column 4. The data are the timestamps (in samples).  Onsets.corrMatrix: As in Onsets.matrix, but here the timestamps are made relative to the start of the fixation onset (i.e., all begin with 1).  Onsets.trialLengths: N x 1 vector, where N is the number of trials, providing the length of each trial (in samples) |
| Triggers.matrix | N x 6 matrix, where N is the number of trials, and the columns reflect each trial event (as in Onsets.matrix). Here, information related to the triggers is given, where each trigger is a 4 digit code. The triggers give information about the trial event (fixation/random/stimulus/response/offset; 1st digit), difficulty level (2nd digit), the direction of motion (3rd digit) and the correctness of the response (4th digit). A key is provided in MarkUpFile\_DC.pdf. |
| *Nb. The following variables reflect intermediate preprocessing steps:* | |
| BadTrial\_thresh | The threshold for the number of electrodes missing in a trial at which point the data in the trial is rejected. |
| EOG | 2 x Z matrix, where Z is the number of frames (continuous data record). First row is vertical EOG and second row is horizontal EOG. |
| FilterSpec | Settings of filter applied during Preprocessing script (note that filtering was also carried out when exporting the data from Netstation, as explained in the paper) |
| fnIn | Filename |
| GoodTrial.indicatorMatrix | 1 x N matrix, where N is the number of trials. A value of 1 indicates that this trial is deemed a ‘good trial’, where data can be included. |
| HEOG | Horizontal EOG. 1 x Z matrix, where Z is the number of samples (continuous data record). |
| HEOG\_cell | HEOG for each trial. |
| pctThresh\_rec | The cutoff percentage of high voltages (exceeding uVthresh\_rec) that will lead to the identification of a session-wide bad channel |
| pctThresh\_tr | The cutoff percentage of high voltages (exceeding uVthresh\_tr) that will lead to the identification of a bad channel for a given trial |
| SessionBadElectrodes | Structure with the following fields:  SessionBadElectrodes.indicatorMatrix: 128 x Z, where 128 is the number of channels and Z is the number of samples. This gives 0s and 1s, where 1 indicates that the voltage strictly exceeded uVThresh\_rec (i.e., finds all samples with absolute values above uVThresh\_rec)  SessionBadElectrodes.electrodes: Any electrodes for which pctThresh\_rec% or more samples exceed uvThresh\_rec |
| TrialBadElectrodes.indicatorMatrix | 128 x N indicator matrix, where 128 is the number of channels and N is the number of trials. A value of 1 indicates that there are pctThresh\_tr% of samples o r more in that trial that exceed uVThresh\_tr. |
| trialEpochIdx | N x 2 matrix, where N is the number of trials. The first column is the onset and the second column is the offset for each trial used in epoching (in samples). |
| uVThresh\_rec | Cut-off voltage for identifying block-wide bad channels |
| uvThresh\_tr | Cut-off voltage for identifying bad channels for each trial |
| VEOG | Vertical EOG. 1 x Z matrix, where Z is the number of samples (continuous data record). |
| VEOG\_cell | Vertical EOG for each trial. |
| xClean\_AR | 128 x Z matrix, where Z is the number of samples (continuous data record). This is the data resulting from the intermediary preprocessing step which converts to the average reference |

Note that accuracy and RT data can be extracted from Triggers.matrix and Onsets.matrix (as done in MOVEP\_analysis8\_DC.m and saved in the file *MOVEP\_BehavDat\_taskX.csv* in the zipped file *RCAOutput\_taskX.zip*)

**Key explaining triggers**

*MarkUpFile.pdf*

This is a key explaining the 4 digit codes that were assigned to triggers (Triggers.matrix) during recording (see Experimental code <https://osf.io/wmtpx/>).

**Analysis Output Files**

*AnalysisOutput\_task1.zip*

*AnalysisOutput\_task2.zip*

*AnalysisOutput\_RespLocked\_task1.zip*

*AnalysisOutput\_RespLocked\_task2.zip*

The majority of output files from the MOVEP\_analysis8\_DC.m script (<https://osf.io/z6ys5/>) are stored in *AnalysisOutput\_task1.zip* (for the motion coherence task) and *AnalysisOutput\_task2.zip* (for the direction integration task). These files enable other researchers to run parts of the analysis without having to repeat all stages (please refer to the analysis script to understand precisely what each file contains).

Likewise, the output files from the RespLocked\_analysis\_3groups\_v2.m script (<https://osf.io/d6fbw/>) are stored in *AnalysisOutput\_RespLocked\_task1.zip* (for the motion coherence task) and *AnalysisOutput\_RespLocked\_task2.zip* (for the direction integration task). These files enable other researchers to run parts of the analysis without having to repeat all stages (please refer to the analysis script to understand precisely what each file contains).