

README file for Public Update MIDUS Refresher 1 Project 5 Neuroscience Data

October 2024

***** It is important to read through this document carefully ***
*** prior to using the revised data and documentation. *****

This document outlines a number of revisions, improvements, and updates that have been made to the MIDUS Refresher 1 Project 5 (MR1P5) Neuroscience data since the last version published in 2021.

Note: The revised data and documentation are intended to REPLACE all the files associated with previous releases of the MR1P5 data and documentation.

A. What Data Files Are Available?

The MIDUS Refresher 1 (MR1) Project 5 (P5) Neuroscience dataset contains 138 cases, including: (1) self-report measures of emotion, emotion regulation, anxiety, and empathy; (2) psychophysiological measures including corrugator and zygomatic facial electromyography and eyeblink startle magnitude of emotional reactivity and recovery in response to the presentation of negative, neutral, and positive pictures; (3) reaction time and accuracy measures obtained during the psychophysiology paradigm's task; (4) cognitive data obtained via pen-and-paper and CANTAB (<http://www.cambridgecognition.com/>) cognitive research software; (5) measures derived from BRAVO T1-weighted magnetic resonance imaging (MRI) scans, including measures of brain structure (volume, cortical thickness, cortical curvature, and cortical surface area) calculated using FreeSurfer software (v5.3.0), hippocampal subfield and amygdala nuclei segmentations calculated using FreeSurfer's hippocampal module (v6.0), and brain-predicted age calculated using multiple publicly shared algorithms and deep learning models, as well as (6) diffusion tensor imaging measures of white-matter microstructure derived from diffusion-weighted imaging (DWI) scans.

Updated dataset: *MR1_P5_DATA_N138_20241015*

B. What is the Structure of the P5 Dataset?

This file is an SPSS dataset comprised of self-report data (self-administered questionnaires), behavioral responses to the task during the psychophysiology paradigm, summary measures of psychophysiological data, and measures of brain structure and brain-predicted age derived from MRI scans for 138 cases from the National and Milwaukee Refresher samples. Variables have been named according to MIDUS variable naming and coding conventions. All variables include labels to aide interpretation. Value labels have been applied where appropriate.

Variable naming conventions are described in:

- ***MR1_P5_VARIABLE_NAMES_20241015***

The fourth character of the variable name is a letter that identifies the type, or name, of the instrument used to collect the data. The P5 Instruments are designated by the indicated letters:

- S = Self-reports
- B = Startle Eyeblink
- C = Corrugator EMG
- L = Zygomaticus EMG
- K = Heart Rate Variability
- R = Response Times
- A = Response Accuracy
- N = CANTAB Cognitive measures
- D = Cube & Paper Test
- F = Free Recall
- T = Picture Ratings
- P = Participant Characteristics
- H = Handedness
- O = Hearing Test
- I = General MRI Information
- E = Extracted Structural Brain Measurements
- W = Extracted Diffusion Weighted Imaging Measurements

Remaining characters differ for each measure (i.e., are nested within character 4).

C. Changes to the Dataset

This revised MR1P5 dataset contains 138 cases and 2161 variables (the prior version of this dataset MR1_P5_N138_20210826 contained 1897 variables). This update includes and update to the brainage documentation for the Cole brainage estimates as described in <https://github.com/james-cole/brainageR>, and the addition of other brainage estimates from publicly shared algorithms and deep learning models trained on external datasets. To match the data available for MIDUS 3, this update includes measures of cortical thickness, curvature, surface area, and volume calculated via FreeSurfer software using the Desikan-Killiany-Tourville (Klein & Tourville, 2012) brain atlas. Variables of self-reported neurological condition, radiologist flagged abnormality in MRI, and start time of MRI scans were also added. Additional variables were calculated for the Cube & Paper test to match what was shared for MIDUS 3. Lastly, 3 subjects had their Cube & Paper total score [RA5D] corrected (± 1).

D. What Additional Files Are Available?

1. Information regarding instruments used to collect data and data processing procedures is available:
 - ***MRI_P5_INSTRUMENTS_20241015***
2. Detailed documentation of the self-report/questionnaire measures collected in P5 is available:
 - ***MRI_P5_DOCUMENTATION_OF_SCALES_20241015***
3. An overview of the procedures and timing of tasks during the psychophysiology session is available:
 - ***MRI_P5_DOCUMENTATION_OF_PSYCHOPHYSIOLOGY_20241015***
4. An overview of the CANTAB cognitive assessments is available:
 - ***MRI_P5_DOCUMENTATION_OF_CANTAB_20241015***
5. Information regarding scanning procedures and the processing of T1-weighted and diffusion-weighted scans is available:
 - ***MRI_P5_DOCUMENTATION_OF_BRAIN_MEASURES_20241015***
6. A sample acknowledgment text to be included in publications utilizing this data is available:
 - ***MRI_P5_ACKNOWLEDGEMENT_TEXT_20171214***

Because participation in the Neuroscience Project (P5) was contingent upon first participating in the Biomarker Project (P4) component of MIDUS Refresher 1, see the *MIDUS REFRESHER 1 Biomarkers* documentation for basic information about the sample and recruitment. An additional requirement for the Refresher 1 was that all participants in the Neuroscience Project had to be able to participate in both the psychophysiology and imaging sessions. This meant that all participants had to pass MRI screening criteria (no history of neurological disorders, no magnetic metal or medical devices in the body, no claustrophobia, able to lay on back for two hours, etc.).

E. Where Can I Access the Raw Imaging Files and/or Trial-by-Trial Psychophysiological and Behavioral Data?

Access to the MIDUS Refresher 1 raw MRI data (structural, task functional, resting state functional, diffusion-weighted imaging, and resting perfusion) as well as the trial-by-trial psychophysiological and behavioral data are available but subject to restricted access conditions. Please see https://midus.wisc.edu/midus_neuro_data.php for instructions on how to access.

Please report any errors or inconsistencies you find in the data or documentation to
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