MultiplEYE Experimenter Script

Psychometric Tests Session

History of changes		
Version	**Date**	**Changes**
0.1	16/09/25	Work in progress - First version to be published on MultiplEYE website
0.2	02/10/25	Replaced broken links to documentation sheets

This document outlines the experimental procedure for collecting psychometric data using the MultiplEYE psychometric test battery.
The experimental implementation of the MultiplEYE battery is available in the MultiplEYECOST/MultiplEYE-psychometric-tests repository. Please follow the instructions provided in the README.md file to install and run the tests.

All experimenters should familiarize themselves with the data collection protocol described in this document prior to commencing the experiment. It is recommended that a printed copy of this document be available at all times during the experiment.

For any questions or further assistance, please contact the project support team at (multipleye.project@gmail.com).

Important general remarks

- Participants should feel comfortable at all times while taking part in the study. Always treat participants in a supportive, motivating, and respectful manner.
- The estimated duration of the psychometric testing session is approximately 90 minutes.
- Participants have the right to stop and withdraw from the experiment at any time without providing any justification.
- **Important:** The experiment must be conducted on a computer capable of recording audio via an internal or external microphone. Ensure that the audio recording system is tested prior to the session.
- A general description of each psychometric test can be found in the MultiplEYE Data collection guidelines (section 6).
- Important notes regarding the **Stroop Task**:

- If the Stroop task is conducted in a language in which two color names begin with the same letter (e.g., in Slovenian: *rumena* ‘yellow’ and *rdeča* ‘red’), write the first two letters of each color name on the stickers (e.g., “RU” for *rumena*, “RD” for *rdeča*) to avoid participant confusion.
- Ensure that the **stickers** used in the Stroop task are **neutral in color** (preferably white). This helps minimize external influences on the test performance.

Before the experiment

- Arrive at least 10 minutes before the participant to ensure that all materials and equipment are properly prepared for a smooth session. Follow the steps below to set up and prepare:
- Prepare the setup so that the psychometric tests session can begin immediately upon the participant’s arrival.
- Ensure that you have paper available for taking notes during the session. You may use the **Experimenter Session Documentation Sheet** provided within the MultiplEYE project.
- Ensure that your phone is set to silent mode, with vibration turned off.
- If applicable, prepare reimbursement or participant gifts and keep them out of sight to avoid distraction.
- Verify that the participant's ID, name, and other relevant details are correct.
- Ensure that all equipment is **fully charged** or **connected to a power source** to prevent interruptions during the experiment.
- Turn on the computer and log in.
  Review and, if necessary, edit the *config.yaml* file in the *configs* folder according to the study design. For more detailed instructions, please refer to the README file in MultiplEYECOST/MultiplEYE-psychometric-tests repository.
- **Activate the experiment environment** and and start the psychometric tests by running the appropriate commands in the terminal on the computer:

```
conda activate psychopy

cd MultiplEYE-psychometric-tests

python run_multipleye_psychometric_tests.py
```

  For more detailed instructions, please refer to the README file in MultiplEYECOST/MultiplEYE-psychometric-tests repository.
- Once the experiment software is running, **enter the participant ID** into the GUI. If data are collected across two or more sessions, ensure that the same ID is used for the same participant in all sessions.
- Enter the **session ID** into the GUI. If your data collection is divided into two or more sessions, this option allows you to specify the current session.

- If you wish to administer only a subset of the tests, deselect the tests you are not administering by unchecking the corresponding boxes in the GUI.
- Verify that all other information in the GUI aligns with your laboratory settings.
- If everything is correct, click the "*Start*" button to begin the tests.
    - If the Lewandowsky Working Memory Capacity (WMC) battery is among the tests to be run, a second GUI will appear, prompting you to (de)select the WMC sub-tasks.
    - It is recommended to select all sub-tasks, as indicated by the default setting.
- Once the session has started successfully, the welcome screen of the first test will be displayed. Leave this screen visible until the participant arrives.

At the beginning of the experiment

- Greet the participant in accordance with local customs and current hygiene regulations.
  Example: "Hi, are you [*PARTICIPANT'S NAME]*? Nice to meet you, I am [*YOUR NAME]*. Thank you very much for participating in our study; we really appreciate it!"
- Verify the participant's identity by confirming relevant details (e.g., participant ID from a previous session, if applicable).
- Welcome the participant to the laboratory.
    - Inform the participant that food and drinks are not permitted in the lab or testing booth.
    - Provide a brief overview of the session and the tasks the participant will complete. It is recommended to avoid using the term "test" and instead use "tasks." Explain that these tasks assess aspects of language and cognition relevant to reading and language processing, and that the study aims to better understand their relationship.
    - Do not provide detailed explanations of what specific tasks measure *before* the participant completes them, unless such information is already included in the on-screen instructions. If the participant requests additional details, inform them that you will provide a full explanation at the end of the session.
    - When providing explanations after the session, use accessible, layperson-friendly descriptions such as: "words you know (WikiVocab)", "things to memorize and recall (WMC)", "ignoring the written word (Stroop)", "ignoring the direction of some arrows (Flanker)", "figuring out how a new language works" (PLAB)
- Ask the participant to set their phone to silent mode, turn off vibration, and store it out of sight (e.g., in a bag) to avoid distractions. Ensure that the phone is not visible during the session.
- Disinfect the keyboard, mouse, and button box in front of the participant in accordance with to the current hygiene regulations in your lab and country.
- Ask the participant to take a seat in the experimental chair.
- Begin the oral instructions for the experiment (see the box below).

Oral instructions

Provide participants with a brief overview of the experiment:
“Welcome to the psychometric testing session. Today, you will complete several tasks related to language and cognitive processes, both of which play an important role in reading and language use.
During this session, you will complete six different tasks. These include activities such as memorizing information, naming items, reading words, completing concentration-based tasks, and solving a language-related puzzle.
Please read all instructions carefully. Some tasks have time limits and require quick responses, while others allow you to proceed at your own pace.
Thank you very much for taking part in this study. Your participation is highly valuable and greatly appreciated.”

Additional Points to Include in Oral Instructions

- Instruct participants to read the instructions for each task carefully. If necessary, remind them again during the instruction screens if they appear to be skipping important information.
- Inform participants that most tasks include practice trials and encourage them to use these to familiarize themselves with the keyboard and task requirements. Note that the RAN task does not include practice trials.
- Encourage participants to ask questions during the instruction phase or practice trials if anything is unclear.
- Inform participants about the availability and timing of breaks (see below).

- Inform the participant which buttons on the keyboard or response device they will use during the experiment (e.g., the right arrow key for “yes” and the left arrow key for “no”).
Stroop Task Note
- Key assignments may vary depending on the keyboard layout of the testing device. Ensure that participants are clearly instructed on the correct keys before starting the task.



- On some keyboards, particularly those with different regional layouts, the slash (/) key may not be located in the expected position or may be replaced by the minus (-) key.
- Please **test the task in advance** on your device to confirm which key corresponds to the expected response in the Stroop task. Then, update the two CSV files (for English: *Stroop_practice_trials_en.csv*, *StroopStim_en.csv*) by entering the correct key names in the 'correct_key' column.
- These files are located in the language-specific folder in the implementation directory. For English, the relevant path is "MultiplEYE-psychometric-tests\languages\EN\Stroop-Flanker". For further information on organizing folders within the implementation directory, refer to the README file in MultiplEYECOST/MultiplEYE-psychometric-tests repository.

- Instruct participants to familiarize themselves with the keyboard.
  Experimenter: "Each task uses different keys, so please take a moment to become familiar with the keyboard. This will help ensure that your responses are accurate and prevent unintended mistakes."
- Start the experiment.

Breaks

Participants will be presented with on-screen messages indicating when breaks are available. They should **avoid taking breaks during the tasks themselves**.

Optional breaks

After each task, participants will see a screen informing them that they may take a short break or press the spacebar to continue. If you observe signs of fatigue or reduced focus, encourage participants to take a brief break at this point (e.g., close their eyes, stretch, or briefly stand up and move).

If a participant presses the spacebar but still requires a break, this can still be accommodated, as the break screen is followed by a welcome screen and instruction screens for the next task.

Highly recommended break

A 15-minute break is strongly recommended after completing the WMC battery, which lasts approximately 30-45 minutes and can be cognitively demanding. The subsequent tasks involve reaction time measures and therefore require sustained attention.

During this break, offer participants water or another non-caffeinated beverage.

During the experiment

Handling Interruptions or Errors

First, do not worry if anything unexpected occurs. The session can always be restarted in a flexible manner. Follow the steps below to manage your data:

Copy Final Output
Copy the output from the final interface window (identified by the MultiplEYE logo in the top right corner). Save this output as a text file on your laptop and include it with the corresponding data files. If you contact the support team regarding the error, please attach this file to your message. After saving the output, you may attempt to restart the psychometric tests as described below.

Handling Crashes

- If no tests were completed before the crash, simply rerun the tests as usual.
- If some tests were completed, modify the *config.yaml* file by changing “True” to “False” for the completed tests to avoid repeating them.
- If only some of the WMC sub-tests were completed, keep *wmc* set to “True” in the *config.yaml* file, but deselect the completed sub-tasks in the second GUI.

After Rerunning the Tests

- Once the session has been successfully rerun, check the *data* folder to ensure that all data have been saved correctly.
- Remember to reset the *config.yaml* file to its original settings before the next participant.

Alternative Approach

- You may also choose to rerun the tests without making any changes. This will generate multiple versions of the data files with different timestamps.
- After completing the rerun, manually review the *data* folder and delete any unnecessary duplicate files.

After the experiment

- Reimburse the participant in accordance with the regulations and procedures of your lab and country.
- Thank the participant and conclude the session: “Thank you very much for your time! We would greatly appreciate it if you could help spread the word about this study to others who might be interested in participating. Have a great day!”
- If not already arranged, ask the participant whether they would be willing to take part in an additional psychometric testing session (if applicable).
- Ensure that all data have been saved correctly.

- You should be able to see a .log file and a .csv file in this folder:
  `Multipleye-psychometric-tests > data > psychometric_tests_[LANGUAGE_CODE]_[COUNTRY_CODE]_[LAB_NUMBER] > [TEST NAME] > [PARTICIPANT_ID]_[LANGUAGE_CODE]_[COUNTRY_CODE]_[LAB_NUMBER]_S2`
  - For the RAN task, there is an extra folder storing the recorded audio:
    `audio_[LANGUAGE_CODE][COUNTRY_CODE][LAB_NUMBER]_[PARTICIPANT_ID]_S2_[TIME STAMP]`
- You should also be able to see a .yaml file with participant-specific configurations in:
  `Multipleye-psychometric-tests > data > participant_configs_[LANGUAGE_CODE]_[COUNTRY_CODE]_[LAB_NUMBER] > [PARTICIPANT_ID]_[LANGUAGE_CODE]_[COUNTRY_CODE]_[LAB_NUMBER]_S2.yaml`

- To create a backup of the data, compress (zip) the entire *data/* folder in the *MultiplEYE-psychometric-tests* directory, which contains all output files. Upload the archive to a secure online data repository or transfer it to an external storage device, in accordance with your lab's standard procedures.

Thank you for adhering to the protocol and ensuring a consistent and reliable approach to each session!