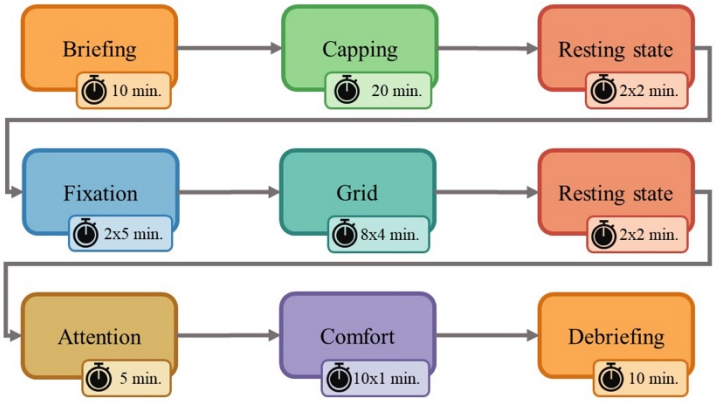
Instructions: [DCC] EEG: A visual brain-computer interface for communication

Preparation -- Before arrival at the Maria Montessori building, please wash your hair and refrain from using any hair products. If you have glasses or contacts, you should wear these during the experiment. Before the experiment starts, you are requested to strap a heart rate monitor around your chest just below the chest muscles. Please wear comfortable clothes to make the process of attaching the strap easier. Please be on time at the designated timeslot at the entrance of the DCC labs, on the first floor next to the cafeteria. Besides that, there is nothing you have to prepare beforehand.

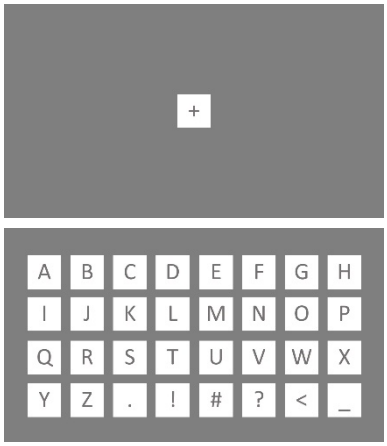
Briefing -- In the figure on the right please find an overview of the experiment. It consists of 9 blocks and takes about 110 minutes. Firstly, during the briefing, you receive some general information about the procedure of the experiment. This information is similar to the content of this document. After you are informed, you are asked to sign a consent form before continuing the experiment. If you do not feel comfortable and want to stop the experiment, you are able to quit at any point.



Capping -- During capping, the heart rate monitor and EEG cap with 64 gel-electrodes are placed. EEG is used to measure your brain activity. During the experiment you are asked to sit still, make eye blinks and movements as little as possible for optimal data quality.

Resting state -- In the resting state block you are asked to relax your body while focussing on a cross that is displayed on the monitor. In both blocks, you first rest for 2 minutes with your eyes open, and subsequently you rest for 2 minutes with your eyes closed.

Fixation -- During the fixation block your task is to focus your eyes on a cross on the screen, see the figure on the right. The square will start flashing in a random-like manner. After flashing for 5 minutes, you can take a small break. Afterwards, you continue with the fixation block for another 5 minutes.



Grid -- The grid block consists of 8 sub-blocks with small breaks in between. During a grid block, a 4 by 8 grid is presented filled with letters and symbols, see the figure on the right. When the task starts, one of the squares is highlighted in green for 800 ms and you should focus your eyes on that square. Then all squares will start flashing rapidly for about 4.2 seconds while you maintain focus on the square that was highlighted. This highlighting and flashing will be done 40 times in each sub-block.

Resting state -- Afterwards, there is a second resting state block identical to the first one.

Attention -- In this task, you have to press the spacebar as fast as possible when a number is shown on the screen. However, when the number 3 is shown, you should *not* press the spacebar. You should try to respond as fast as possible while trying to minimize mistakes as possible.

Comfort -- In this block, you are presented with different versions of the grid one-by-one. For each, you are asked to judge the eyestrain (i.e., tired eyes) it causes in the range of 1 (low) to 7 (high).

Debriefing -- Finally, the experiment is finished. The EEG cap and heart rate monitor will be removed, and you can wash your hair. If you have any remarks or questions about the experiment, please feel free to ask them now. Once the experiment is done, you will obtain your well-deserved payment or participant hours.

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