Preddi Brains Research Project - Imaging

fMRI Study Protocol

**Introduction**

The PreddiBrains fMRI study will be conducted at the 3T scanner housed at the Fondation Campus Biotech Geneva (FCBG), Chemin des Mines 9, Geneva. Paper advertisements will be distributed on the FCBG and UniMail campuses. Online advertisements will be posted ideally on the Sona system, as well as anibis, petitesannonces, (virtual) word-of-mouth, assorted email lists. We will aim to book MRI slots through Calpendo a month ahead (when bookings open), two half-days a week, for a total of 4 slots per week. Each session will be booked for 1 hour. Some coordination will be required when scheduling sessions back to back, as each experimental session requires an intake period (approximately 30 minutes) and a debrief of approximately 10 minutes.

1. ***Participant Recruitment***

Interested participants will be asked to contact us via the following email account:

Gmail account : [studiesgva@gmail.com](mailto:studiesgva@gmail.com)

Password: LaserThis

Once participants contact us, we will send them a template response describing the study and providing instructions on how to sign-up for timeslots, referring them to a Google sign-up sheet. This gmail account’s drive contains several documents pertaining to the study:

1.The study mastersheet, to be filled by the experimenter. This form is strictly confidential.

2.The study sign-up sheet, where the experimenter will upload study timeslots, and participants will sign up. This sheet needs to be regularly monitored to ensure participants fill it out correctly.

3.The MRI safety form, to be sent to participants 2 days before the study.

4.The informed consent form, to be sent to participants 2 days before the study.

5.Task instruction sheets, to be sent to participants 2 days before the study. This form will describe the task the participant is meant to do during the session, so that they have the chance to ask us any questions beforehand and also to speed up the intake process when they come in person.

***2. Participant experimental timeline***

*2.1 Two days before study*

Remind them of study by email. Inform them that if no confirmation is received, **their scan will be cancelled\***. Remind them of MRI restrictions (send them MR digital form). Ask them to confirm they understand the task of the study\*\*.

\* The first goal here is to avoid no-shows at all costs. Scanning time is 250 CHF/hr. If we do not cancel a booking 24 hours in advance, it gets charged. Therefore, we must be diligent and strict with participants on this particular point.

\*\* The second goal here is to ensure participants understand what is required from them in the task **prior to arriving**.

*2.2 Day before study*

Receive their confirmation and working telephone number.

*2.3 Day of study*

a. Subjects are greeted at the entrance of the Campus Biotech and asked to proceed to the MRI area. (5 min)

b. Leave them to read and sign informed consent and MRI safety in MRI waiting area. Risks and inconveniences will be reviewed verbally, to ensure participants understand the substance and details of their engagement. Subjects will be asked if they have any questions concerning the procedure. If there are none, subjects and experimenter sign the forms. (10 min)

c. Go over the task and procedure in MRI waiting area (5 min)

In task 1 (session 1), participants will be shown a noise mask, followed by, possibly, a cube, shown briefly. Participants will then see another noise mask. They will then be asked if they saw a cube or not. Then they will be asked if they saw it from above, or from below. They will then be asked to rate how confident they were in their last response. The task will last approximately 35 minutes. In task 2 (session 2), participants will be shown a noise mask, followed by, possibly, a face, shown briefly. Participants will then see another noise mask. They will then be asked if they saw a face or not. Then they will be asked if the face was angry or happy. They will then be asked to rate how confident they were in their last response. The task will last approximately 35 minutes.

*2.4 Experimental Procedure*

2.4.1 When entering the MRI scanner, participants must remove all jewelry and empty pockets. Ensure that they go in with no metal: this includes asking participants to remove wigs, hair accessories and piercings. Subjects with the following tattoos cannot be scanned: on the neck/face/head; with red ink; tattoo obtained outside of salon (ship, prison, etc).

2.4.2 In the bore, participants will be hooked up to several sensors. This includes a pulse meter (for cardiac signals); a respirometer (pneumatic belt attached to the top of the stomach). They will further be given earplugs; and headphones. They will also be given an emergency bulb to be placed on the chest. Make sure they know how to squeeze the bulb in case they need to communicate with the experimenter during the MRI exam. Finally, hand the participant one FORP response box, with the cable coming out of the left side of the box. Tell them that not seeing the cube/face requires a button press of the left most button, and seeing the cube/face, a button press of the rightmost button. Then, seeing the cube from below/angry face requires a button press of the left most button, and seeing the cube from above/happy face, a button press of the rightmost button. Inform them that, for the confidence scale, they can move the cursor along the line with left/right buttons, and enter their selection with either buttons in the middle. As participants are moved into the scanner bore, we will ensure that, after turning on the laser to calibrate head position, they can clearly see the screen. Then move participants into the scanner to the 0 position and exit the MR room.

2.4.3 In the control room, make contact with the participant over the microphone. Inform the participant that the exam will be starting, with 3 sequences where they can relax and don’t have to do anything, lasting about 7 minutes in total, and that we will communicate with them before the task is launched.

2.4.4 Start Biopac. Make sure the cardiac and respiration channel recordings make sense.

2.4.5 Open the subject info intake script. Fill it out. Open the main experiment script.

2.4.6 Following the 3 scans, make contact with the participant and keep the mic open. Ask them how they feel. Then tell them that the task is about to start.

2.4.7 Launch experimental script. Make sure it is on the correct monitor (the one mirrored to the scanner projector). Make sure the PC’s mouse is clicked into psychopy’s grey screen. The participant will see the instructions and when ready, press a button. This will switch the screen to a “waiting for scanner” message. This is our cue to launch the EPI sequence. Launch the EPI sequence. Ensure that the experiment starts. All information relating to experimental progress is displayed on the python console. Ensure that subject is responding etc.

2.4.8 At the end of the experiment, stop the EPI sequence and inform the participant over the mic that we are coming in to get them out. Remove the participant from the scanner, unhook all peripherals, and give them a moment when they sit up. Then gently prod them out of the scanner (we don’t want to go over an hour in the scanner) and lead them back to the waiting room, where you pay them for their time (20 CHF/hr), have them sign the receipt, hand them a debrief form explaining what we did and why, and send them away.

***2.5 Procedure End***

Ensure that the behavioral data are saved in .csv before closing python. Ensure transfer of MRI data is made. Ensure BioPac files are saved too.

Appendix