



Multiple contributions to action control

Information for participants

The ability to control behaviour is important for our everyday functioning. Cancelling initiated actions when needed is called inhibitory control and it is one of the cognitive functions supporting goal-directed behaviour and adaptability. This function appears to vary across people, contexts, disorders, and throughout the life span, but there are still much we do not know about how this variation occurs. The purpose of this project is to investigate the relationship between behavioural and neural measures related to inhibitory control, as well as extending the knowledge about which processes support this ability.

For this project, we would like you to complete a computer-based inhibition task while we measure your brain activity with electroencephalography (EEG), your muscle activity with electromyography (EMG) and your pupil size with pupillometry. We also want to use EEG to measure your brain activity while you rest. In addition, we will collect some basic demographic information about you, such as age, sex, gender, and handedness. Prior to signing up for this study, you will be asked to consider your responses to some health-related questions to assess your eligibility. Your responses to these latter questions will not be stored.

In total, you should estimate spending approximately 2.5 hours on participating in this project. This consists of around 30 minutes of preparing the various methods, 1 hour for the experimental task, and 15 minutes for a resting state measurement. This also includes some extra time for breaks, removing the equipment, washing the hair etc after the measurements are completed. The study takes place at the Department of Psychology, University of Oslo.

The following pages explain the study procedure and methods in detail. Please read this information carefully before deciding whether to participate in the study. Should anything remain unclear, please do not hesitate to ask the investigators.

Information is stored and shared only in anonymised form

For this project, we wish to store demographic information about you, as well as data from the EEG, EMG, and pupillometry recordings. Any information collected in the context of this study will be kept strictly confidential and only be disclosed in anonymous form, which means the information cannot be connected to your name. All our staff is subject to professional secrecy and data protection compliance. If the results of the study are published, the privacy of the



participants' data and contribution is guaranteed in its entirety. If you decide to participate in this project, you will need to sign a consent form.

You have the right to withdraw your consent during the participation

Participating in this study is voluntary and you can withdraw your consent to participate in the study at any time during participation. You do not need to provide any reason and withdrawing has no negative consequences. You can no longer withdraw your consent for the storage of the data after completing your participation. This is because the data is stored anonymously, making it impossible to delete data specific to you.

Description of the methods and potential risks

In this experiment we will be using electroencephalography (EEG), electromyography (EMG), and pupillometry. The following paragraphs describe the different methods and the potential risks and disadvantages that these entail.

EEG – Electroencephalography

An EEG measurement involves placing a cap with electrodes on the head to measure the brain activity that arises when large numbers of brain cells communicate. This gives us unique insights into fast brain signals and helps us investigate short-lasting cognitive processes. EEG is considered a safe and pain-free method, and it is one of the standard tools for clinical diagnostics and brain research.

When we conduct an EEG recording, we use a specially made cap with many small holes. Each hole is carefully filled with hypoallergenic gel before we attach the electrodes to the holes. This allows us to transfer the brain activity from the scalp to the electrodes to record it. You will have the opportunity to wash and dry your hair immediately after the measurement.

In rare cases, the gel used to make contact between the skin and electrodes may lead to slight local skin irritations. These usually disappear within a few hours. The use of a skin cream may further support recovery.

EMG – Electromyography

An EMG measurement involves electrodes placed on cleaned skin to record the electrical activity of the underlying muscles. It works by the same principles as the EEG, and even uses the same equipment. Here, two electrodes will be placed on each thumb, and the hypoallergenic gel helps to transfer the signals from the skin to the electrodes.

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EMG recordings are painless and safe. The same considerations as for EEG apply.

Pupillometry

Pupillometry measures the size and reactivity of your pupils, which is caused by activity in muscles around the iris. This activity is in turn sensitive to variations in cognitive processing. We measure the pupil size using a small camera placed underneath the computer screen. This tracks where you are looking as well as changes in the size of your pupil. During the recording, you will be asked to rest your head on a chin rest to stabilise the head. This helps avoid unnecessary eye and head movements, but the forward-leaning position might feel tiring over time for some. To combat this, there will be a break every five minutes where you can move more freely.

Pupillometry recordings are completely painless and safe, and they are a standard tool in psychological and neuroscience research.

Financial compensation

All participants receive a gift card (Universal Presentkort) worth 300 NOK to compensate for the study participation.

Further questions?

If you have any questions, please contact PhD research fellow Christina Thunberg (christina.thunberg@psykologi.uio.no) or Prof. René Huster (rene.huster@psykologi.uio.no), both at the Department of Psychology, University of Oslo.

We thank you for your interest and support!



Informed Consent to participate in the project “Multiple contributions to action control”

I confirm that I have been informed in writing about the study purpose and the experimental procedure. I have read and understood the participant information sheet regarding the investigation. In addition, I have been verbally informed about study details. If I had any questions about the proposed study, they were answered fully and to my satisfaction.

I consent to the described collection and processing of physiological, behavioural, and demographic data. The storing and analysis of the data is handled anonymously by assigning a number to each participant and not using the name. My data are stored completely anonymously. That is, it is not possible to connect the collected data to my name.

I understand that I can withdraw my consent for the storage of the data at any time during the study participation, but that I cannot do so after I have completed my participation. This is because my data records can no longer be identified. In addition, once my data have been included in study analyses and publications, the experimenters are required by national and international regulations to keep data intact as published.

I agree that my anonymised data may be used for further research purposes and that it will be stored for at least 5 years. By agreeing to participate in the study, I am also consenting to that in accordance with national and international regulations about data sharing, my anonymised data can be transferred to public scientific databases, where the data can be stored for 10 years or more.

My current physical condition allows me to participate in the study. I have completed the questionnaires for participating in electroencephalographic (EEG), electromyographic (EMG), and pupillometry studies truthfully.

I am aware that no medical diagnostics will be performed, and that the neurological measurements cannot be used for proper medical diagnosis. The techniques applied here are optimised for research applications. Neither are the applied measurement techniques suitable for diagnostic purposes, nor is the study personnel trained in medical diagnostics.

To be signed upon arrival

Name and signature of the participant

To be signed upon arrival

Name and signature of the experimenter

To be filled out upon arrival

Date & Place