Information sheet

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An investigation into the causal role of alpha oscillations in attention

You are being invited to take part in a research study. Before you decide to participate, it is important for you to understand why the research is being done and what it will involve. Please take your time to read the following information carefully, and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take your time to decide whether or not you wish to take part. This study involves three separate sessions, lasting about 90 minutes each to take place on three separate days. However, there is a chance that, at no fault of your own, the data we collect will not meet our criteria for taking part in the study. In this case, you will be reimbursed for the first day in full, but asked not to return for the following sessions.

The purpose of the research

This research is aimed at providing us with a better understanding of how our brain focuses on our body and detects touch. It is believed that certain brain frequencies help direct our focus (attention). First we want to detect your individual brain frequency by measuring your brain activity using a technique called electroencephalography (EEG) while you feel small light taps (by a machine) repeatedly on your index finger. Then we will use a method of brain stimulation, called transcranial Alternating Current Stimulation (or tACS), to temporarily change your brain frequencies see if this effects how you detect touch. We will use tACS to stimulate your brain while you take part in the finger tapping experiment on three separate days. On two of those days you will receive real brain stimulation and on one it will be placebo stimulation. You will only find our which day was real and which was fake at the end of the three days. The exact details of this study are outlined below, please read these carefully and ask any questions you have to the experimenter.

What will happen to me if I take part?

The experiment is being run over three days and you will have at least 12 hours between each session. Each session should take no longer than 90 minutes each and will be conducted in a dedicated psychophysiology laboratory. There are several aspects to the experiment explained below:

Questionnaires:
Before you take part you will need to fill in a screening questionnaire. This is a safety screening questionnaire that will allow us to determine whether it is safe for you to take part.

Electroencephalography (EEG):
EEG involves placing small sensors (electrodes) on the surface of your scalp; they record small electrical activity. Electrodes will also be placed to the left and right, and above and below your eyes to measure eye movements. In order to achieve good level of conductance, your skin may be cleaned with alcohol before these electrodes are attached. To get a good connection between the scalp and electrodes a conductive gel will be used. This gel is specifically manufactured to be used for EEG testing such as this and is very unlikely to cause any irritation. However, it should not be used on damaged skin or if you have a history of skin allergies. Specific details of the content of the gel are available and

you can try a small amount of gel on your arm first if you wish to test what it feels like. This gel washes out very easily with warm water, and shower facilities, a towel to dry your hair, and a hairdryer will be provided. While we record EEG you will put your index fingers on a small disc that will presents small taps to your index finger.

Transcranial Alternating Current Stimulation:

The next part of the study will involve a technique called transcranial Alternating Current Stimulation (tACS) that can change brain activity for a temporary period of time. It works by applying a very small current (2.0 milliamps) to your scalp that passes through your head and brain and changes the electrical properties of the brain cells under the electrode. The amount of current that is discharged from the device across your scalp is very small and poses no physical danger. However, **you should tell us if you have a cardiac pacemaker or other implanted medical devices, any metal clips on blood vessels, or pieces of metal inside your body**, since the electrical current might have an effect on these. It is important that you realise that transcranial Alternating Current Stimulation is not the same as procedures used in clinical practice such as ECT (electroconvulsive therapy). You should complete the transcranial Alternating Current Stimulation Adult Safety Screen (TASS) questionnaire before taking part; this will allow the experimenter to judge if it is safe or not for you to take part. Completion of the screening form may result in exclusion from participation and women who are pregnant will also not be able to participate.

tACS is carried out by applying two rubber pads with conductive gel on them to your scalp. These rubber pads are the electrodes and are held in place with a thick elastic band much like a bandage. A very small current is then passed through the electrodes: exactly 2.0 milliamps. The machine, for the first 20 seconds, slowly ramps up the current from zero to one milliamp so as to accustom you to the sensation . During the ramp up period, which lasts 20 seconds, you will likely feel a tingling or an itching sensation under the sponges. The current will be applied to your scalp for a maximum of one hour per session. Should you wish to withdraw during this period, or any other time, you can of course do so without any negative consequences.

During the brain stimulation you will be asked to complete a task. This task will involve detecting a touch sensation delivered to either your right or left index finger.

Possible Side Effects and Hazards of transcranial Electrical Stimulation

Electrical stimulation can be harmful in people who have a pacemaker or other devices in the heart, significant heart disease, an implanted medication pump, a metal plate in the skull, a cochlear (ear) implant, an implanted brain stimulator, increased pressure inside the head, or metal objects inside the eye or skull (for example after brain surgery or a shrapnel wound). Please inform the investigators if you might have any of these. Since the effects of electrical stimulation on the foetus are unknown, we will ask you **if there is a chance that you might be pregnant**. We will use a screening form to evaluate these and other conditions.

Transcranial Alternating Current Stimulation has been used safely in thousands of individuals around the world. The researchers of this study have received extensive training on this method and the study adheres to the latest safety guidelines. The common side effects of tACS are a slight discomfort at the site on your skull where we are applying the stimulation. In healthy human subjects, tACS is regarded as a safe and non-invasive method. If you currently suffer from or suffered in the past from any neurological or psychiatric disease, you have to report this to the investigators. If you have any significant adverse event, we will stop the study, even if you are willing to continue.

Consent

You will be given a copy of the information sheet and asked to sign a consent form prior to taking part in the research. It is important that you are aware that **participation in this research is entirely voluntary**. You do not have to take part if you do not want to. If you decide to take part **you may withdraw at any time during your participation without giving a reason**. You may withdraw your data up until data analysis begins in January 2019.

All data relating to your participation in this study will be held and processed in the strictest confidence, in accordance with the Data Protection Act (1998). All data will be held securely in password protected computer files and locked filing cabinets. Your identity will not be passed on to anyone who is not involved in this study, and will be protected in the publication of any findings.

All proposals for research using human participants are reviewed by an Ethics Committee before they can proceed. The Middlesex Psychology Department's Ethics Committee have reviewed this proposal.

Thank you for taking the time to read the information sheet. If you require advice, information or reassurance about a technical or health related matter, or have a concern about any other aspect of your participation, please raise this with one of the investigators:

Investigator Contact Details:

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