Informed Consent Form

TITLE: Brain stimulation study of human visually-guided navigation using repetitive transcranial magnetic stimulation (rTMS)

NCT NUMBER: NCT04961645

IRB APPROVAL DATE: June 4, 2024

You Are Being Asked to Be in a Research Study
Key Concepts

You are being asked to be in a research study. A research study is designed to answer a scientific question. If you agree to be in the study you will be one of 38 people who are being studied at Emory.

Why is this study being done?
This study is being done to answer the question: What are the brain regions involved in our ability to navigate through the local environment (e.g., walking around your bedroom flawlessly and effortlessly, not bumping into the walls or furniture)? You are being asked to be in this research study because you are a healthy individual who on a daily basis is constantly navigating through numerous local environments.

Do you have to be in the study?
It is your decision to be part of this research study. You do not have to be in it. Before you make your decision, you should take time to learn about the study.

What do I have to do if I choose to participate in this study?
If you are eligible and want to be part of the study, participation will require up to 2 days (2 visits), each taking about one and a half hours. The researchers will ask you to do the following: undergo an fMRI scan (on the first visit) and undergo TMS (on the second visit). ALL of these procedures will be paid for by the study.

How is this study going to help you?
If you are in the study, you will be helping the researchers answer the study question.

What are the risks or discomforts I should know about before making a decision?
The study will take time. All studies have some risks. Some risks are relatively small, like being bored or losing time. Some are more serious – for this study, these include: i) some nervousness or claustrophobia (anxious or afraid of closed spaces) while in the MRI machine (if this happens to you, you may ask to be withdrawn immediately); ii) a sense of dizziness in the MRI machine (this sensation is due to the strong magnetic field, and if it disturbs you, you may ask to be withdrawn); and iii) mild discomfort or tingling in the head or face, or a slight headache due to twitching of muscles in the head or face during TMS (if this happens to you, you may ask to be withdrawn immediately). A full list of expected risks, their frequency and severity are in the “Risks and Discomforts” section in the below document.

Alternatives to Joining This Study
Since this is not a treatment study, the alternative is not to participate.

Costs
You WILL NOT have to pay for any of the study procedures.

What Should I Do Next?
Read this form, or have it read to you. Make sure the study doctor or study staff explains the study to you. Ask questions (e.g., about exact time commitment, about unfamiliar words, more details on specific procedures, etc.). Take time to consider this, and talk about it with your family and friends.

Emory University
Consent to be a Research Subject

Title: Brain stimulation studies of human visually-guided navigation using repetitive transcranial magnetic stimulation (rTMS)

Principal Investigator: Daniel D. Dilks, Ph.D., Associate Professor, Department of Psychology

Funding Source: NIH 5-R01-EY029724

Introduction

You are being asked to be in a research study. This form is designed to tell you everything you need to think about before you decide to consent (agree) to be in the study or not to be in the study. **It is entirely your choice. If you decide to take part, you can change your mind later on and withdraw from the research study.**

Before making your decision:

- Please carefully read this form or have it read to you
- Please ask questions about anything that is not clear

You can take a copy of this consent form, to keep. Feel free to take your time thinking about whether you would like to participate. By signing this form you will not give up any legal rights.

A description of this clinical trial is available on http://www.ClinicalTrials.gov, as required by U.S. law. This Web site will not include information that can identify you. At most the Web site will include a summary of the results. You can search this Web site at any time.

Study Overview

The purpose of this study is to test the brain regions identified with brain imaging methods – called functional magnetic resonance imaging (fMRI) – involved in our ability to navigate (e.g., walking around one's bedroom flawlessly and effortlessly, not bumping into the walls or furniture). By using brain stimulation methods, we will ask not just whether a given brain region is active during a navigation task, but whether that brain region is necessary for that task. The brain stimulation device – called transcranial magnetic stimulation (TMS) – is an FDA approved device for use for treating depression and certain migraine conditions, but is being used in this research for investigational purposes, not for clinical purposes. There is minimal risk associated with TMS used as an investigational device (see below under the rTMS section). Participation will require up to two visits, each taking about one and a half hours. This research will continue until about 38 participants have been tested.

Procedures

Please read this consent form. Before you decide to take part, discuss any questions or concerns with the research team. If you agree to be in this study, you will need to sign this consent form before starting in the study. All the procedures in this study are for research only. The study visits will take place in the Psychology and Interdisciplinary Sciences (PAIS) building at Emory University. You will have to do nothing to prepare for participation in this research, except show up for your scheduled appointment.

fMRI: This study visit will take place at the [redacted] To be scanned, you will be asked to remove all jewelry and other metal-containing objects (including credit cards). You will enter a large room where a powerful magnet is located. You will be asked to lie down on a narrow table and then you

will be put in a small tunnel approximately 6 feet long and 2 feet in diameter. You will then be asked to lie as still as possible during the scan for approximately 90 minutes. A small mirror will be positioned above your head so you will be able to see out the end of the scanner. During scanning, you will hear a loud banging noise as the MRI machine takes pictures of your brain. This is normal. You will be given earplugs to make you more comfortable. While you lie in the scanner, a computer display will be placed at one end of the tunnel. You will be able to see the display through the mirror in front of your face. In some cases, we will need you to respond to things you see on the display screen, and for this you will be given a small box with buttons that will be placed under your hand when you are placed into the scanner. Specifically, you will be asked to view pictures of faces, places, objects, and abstract patterns.

rTMS: This study visit will take place at the [redacted] You will be given earplugs to protect your hearing, and seated comfortably in a chair. Participants will then be asked to complete either a simple computer-based task (e.g., imagine you are walking through the room, and respond via button press whether they can leave through a door on the left, center, or right wall, as indicated by a continuous path on the floor), or a simple behavioral task that will require them to actually walk around in a small room and search for hidden objects. Either during or just before, you do these tasks, we will stimulate your brain with a method called “repetitive transcranial magnetic stimulation” or rTMS. In rTMS, we place a small plastic figure-8 coil next to your head. The position of the coil will be guided by the MRI study we conducted on you in the past. A magnetic pulse will then be generated by the coil. When this happens you may feel a gentle flick and hear an audible click. This pulse is not usually painful, but it can cause a twitch of your hand or face muscles. rTMS is a very safe and noninvasive method for affecting brain function by using electromagnetism. As the electrical current flows through the coil, a magnetic field is generated that goes into the brain and briefly alters neural activity in brain areas lying directly beneath the coil. Thus, rTMS provides a way for investigators to produce a transient and reversible period of brain disruption or “virtual lesion.” Many prior studies have used rTMS to investigate face, scene, or object processing. In all of these studies, the effects of rTMS are short lasting (less than a minute), and no permanent effects have ever been reported.

It is important that you understand that you are free to terminate the session at any time if you feel uncomfortable. The entire session should last no more than 1.5 hours. You will be given breaks every 5-10 minutes or more often if you desire. Finally, at the end of the experiment, you will be asked to remain with the experimenter for 15 minutes. After this 15 minutes is up, you will be asked if you feel safe to leave, and if you do, you will then be escorted to the exit. If you do not feel safe to leave after the 15 minutes is up, you will be asked to stay until you do feel safe to leave. If further assistance is needed, Dr. Gregory Berns (M.D./Ph.D), the head of FERN, will be contacted to come to the testing room.

Risks and Discomforts

There are minimal risks involved with these procedures, although they may at times be unpleasant.

MRI: The MRI machine is as loud as riding in a loud train – you will be given earplugs to lessen the noise. You may experience some muscle discomfort while lying in the scanner. You may also become too hot or too cold, in which case you may ask for an adjustment of room temperature or a blanket. Some people become nervous or claustrophobic (anxious or afraid of closed spaces) in the scanner. If this happens to you, you may ask to be withdrawn immediately. You may also experience a sense of dizziness in the magnet. This sensation is due to the strong magnetic field, and if it disturbs you, you may ask to be withdrawn. Because the magnetic field will affect any metallic object, you should not participate if you have any type of metallic implant in your body, including pacemakers, aneurysm clips, shrapnel, metal fragments, orthopedic pins, screws, or plates, metallic IUD’s, or piercings that you cannot remove. If you have any of these items in your body, there is a risk that the magnetic field could cause them to move or heat up. It is important that you inform the study personnel if you have any implants. Because FERN (Facility for Education & Research in Neuroscience) is not a hospital facility, there is not a physician or emergency personnel on site. This type of brain scan is not designed to detect problems of the brain. A radiologist will not be reading the scan. The study team will review the scan. If there are any incidental findings or we discover that data from the scan suggest something that may be

important clinically, we will share them with Dr. Gregory Berns (M.D./Ph.D), who will determine its clinical relevance, and contact you with further information (e.g., to seek a health professional).

rTMS: The most common risk and discomfort of rTMS expected in this study is mild discomfort or tingling due to twitching of muscles in the head or face. The twitching immediately subsides after the rTMS is stopped. If, at any time, you feel uncomfortable due to such twitching, you may tell us, and we will stop the test. In previous studies with rTMS, between 5-15% of participants experience discomfort and withdrew from the study. Some people undergoing rTMS (approximately 3%) experience headaches, which may be due to excessive muscle tension. In the case of a headache, the experiment will be immediately stopped. The headaches are not recurring and subside after we stop the procedures. About 1% of people undergoing rTMS experience neck stiffness and neck pain. This stiffness and pain is believed to be due to the straight posture of the head and neck during the application of rTMS. In the case of neck stiffness and/or pain, the experiment will be stopped. There are no reports of any such effects recurring. rTMS produces a loud clicking noise when the current passes through the coil. This loud click can cause tinnitus and temporary hearing loss if no protection is used. To prevent that we will ask you to wear earplugs. Animal and human studies have demonstrated that earplugs can effectively prevent the risk of hearing disturbances or discomfort due to rTMS. The ear protection devices reduce the intensity level of the click to approximately 80 dB. Finally, risk of seizures in healthy participants is very low, but not zero. Only two cases of seizures or possible seizures have been reported from the thousands of subjects (probably tens of thousands of subjects) who have experienced rTMS. To minimize any possible risk of a seizure during testing, you will certify that neither you, nor your parents, brothers or sisters, or children have ever suffered an epileptic seizure. You will also certify that you have never suffered a known brain injury, and that you are not taking certain medications that may increase the risk of seizures or reduce the effects of rTMS. If, in the rare event, you experience a seizure, Dr. Gregory Berns (M.D./Ph.D.) will be contacted immediately to come to the testing room, and Emory EMS ([redacted]) will also be contacted immediately. Due to the investigative nature of the study, there may be other risks that are currently unknown.

It is possible that the researchers will learn something new during the study about the risks of being in it. If this happens, they will tell you about it. Then you can decide if you want to continue to be in this study or not. You may be asked to sign a new consent form that includes the new information if you decide to stay in the study.

Benefits

There is no direct benefit to you from taking part in this study. However, this research study may help us learn more about how our brains enable us to understand visual information. The study results may be used to help others in the future.

Compensation

During the first visit (fMRI), you will receive $25/hour to compensate for your time and effort. During the second visit (rTMS), you will receive $20/hour to compensate for your time and effort. If they do not finish the study, we will compensate you for the time you have completed. Overall, you will get between $30.00 and $60.00 total, if you complete all study activities.

Confidentiality

Certain offices and people other than the researchers may look at study records. Government agencies and Emory employees overseeing proper study conduct may look at your study records. These offices include the Office for Human Research Protections, the funder(s), the Emory Institutional Review Board, the Emory Office of Research Compliance and the Office for Clinical Research. Study funders may also look at your study records. Emory will keep any research records we create private to the extent we are required to do so by law. A study number rather than your name will be used on study records wherever possible. Your name and other facts that might point to you will not appear when we present this study or publish its results.

Certificate of Confidentiality

There is a Certificate of Confidentiality from the National Institutes of Health for this Study. The Certificate of Confidentiality helps us to keep others from learning that you participated in this study. Emory will rely on the Certificate of Confidentiality to refuse to give out study information that identifies you. For example, if Emory received a subpoena for study records, it would not give out information that identifies you. The Certificate of Confidentiality does not stop you or someone else, like a member of your family, from giving out information about your participation in this study. For example, if you let your insurance company know that you are in this study, and you agree to give the insurance company research information, then the investigator cannot use the Certificate to withhold this information. This means you and your family also need to protect your own privacy.

The Certificate does not stop Emory from making the following disclosures about you:

- Giving state public health officials information about certain infectious diseases,
- Giving law officials information about abuse of a child, elderly person or disabled person.
- Giving out information to prevent harm to you or others.

Giving the study sponsor or funders information about the study, including information for an audit or evaluation.

Voluntary Participation and Withdrawal from the Study

The study team has the right to end your participation in this study for any of the following reasons: If it would be dangerous for you to continue, if you do not follow study procedures as directed by the study team, or if the sponsor decides to end the study.

Your participation is voluntary and you have the right to refuse to be in this study. You can stop at anytime after giving your consent. You have the right to leave a study at any time without penalty. You may refuse to do any procedures you do not feel comfortable with, or answer any questions that you do not wish to answer. If you choose to withdraw, you can request that your information not be used in the study.

Contact Information

Contact Daniel Dilks at [redacted]

- if you feel you have had a research-related injury, or
- if you have questions, concerns or complaints about the research

Contact the Emory Institutional Review Board at 404-712-0720 or 877-503-9797 or irb@emory.edu:

- if you have questions about your rights as a research participant.
- if you have questions, concerns or complaints about the research.
- You may also let the IRB know about your experience as a research participant through our Research Participant Survey at http://www.surveymonkey.com/s/6ZDMW75.

Consent

Please, print your name and sign below if you agree to be in this study. By signing this consent form, you will not give up any of your legal rights. We will give you a copy of the signed consent, to keep.

_____

Name of Subject

_____ _____

Signature of Subject Date Time

Signature of Person Conducting Informed Consent Discussion | Date | Time