University of Nevada, Reno
Consent Form, Biomedical Research

Title of Study:	**Neuroimaging and behavioral study of complex stimuli and tasks**
Principal Investigator:	***Mark Lescroart, Ph.D. (775) 682-6807***
Study ID Number:	**1992692**

Summary of Key Elements

With this form we are asking for your consent to participate in our behavioral and neuroimaging study. Participation is not mandatory for a grade in any class, nor for standing in any laboratory, graduate program, or job. In this study, your brain will be scanned with functional magnetic resonance imaging (fMRI) while you attend to and make judgments about different images or videos shown on a projection screen. You will respond with button presses. During the study, in addition to collecting your brain and button-press responses, we may capture videos of your eyes to track what you are looking at throughout the course of the experiment. fMRI has been used for medical and research purposes for many years and is considered minimal risk, but the risk is not zero. The main risks associated with fMRI are due to the strong magnetic field, which can pull very strongly on metal objects. These risks can be minimized with careful screening of participants and following of instructions at the scanner. The MRI scanner is also quite loud, so there is some risk to hearing, which is minimized with earplugs. Aside from these risks, the main risk of this study is to your privacy. The research team are not medical doctors, but images of your brain may reveal previously unknown medical conditions, and it may be possible to use the images of your eyes as a biomarker. We will minimize risks to privacy by keeping your fMRI data and eye images on password-protected computers and by de-identifying your data prior to showing to or sharing them with other researchers. There is also a mild risk of discomfort due to lying still for a long period of time (up to an hour and a half) or from motion sickness due to motion in the stimuli. You may stop the experiment at any time if you are uncomfortable. Please continue reading or more information about all elements of the study.

Introduction

Before you agree to participate in this research study, it is important that you read and understand the following information. This form describes why we are performing this study, what we will be doing, why we are doing it, and any possible risks or discomforts that you may experience. Your decision to participate in this study is voluntary, and you may withdraw from the study at any time and without suffering any negative consequences.

This is not a medical study. The experimental procedures used in this study are not designed to detect, diagnose, treat, or cure any disorder. Your choice to participate in this study will have no impact on any medical care you may be receiving. We cannot promise you any personal benefit from participating in this study. However, the results of this study may reveal new insights into how the brain supports fundamental cognitive processes like perception and attention.

Magnetic Resonance Imaging (MRI) has been used in medical and research settings for over 30 years. There are very few risks to participating, however, the risk is not zero. It is very important

that you tell members of the research team the truth about your health history and let the research team know immediately if you experience any negative symptoms or reactions. Failure to do so may lead to injury.

You do not have to be in this study. If you choose not to participate, you will not be affected in any negative way.

Take as much time as you need to decide. If you say yes now but change your mind, you may withdraw the study at any time by informing a member of the research team. Withdrawal from the study will have no effect on any medical treatment you are receiving or your relationship with the research team.

There may be words or text in this consent form that you do not understand. If you are unsure what a word means or have questions about any part of this form, please ask a member of the research team for clarification.

Study Purpose

Different parts of the brain have different jobs. For example, your visual cortex is responsible for processing visual sensory information, while your auditory cortex is responsible for processing auditory sensory information. The goal of this study is to understand the basic visual processes occurring by default in your brain, as well as whether – and how – your expectations about upcoming events influence how the different parts of your brain process visual sensory information.

To study this question, we will use functional magnetic resonance imaging (fMRI), a non-invasive technique that allows us to track changes in cerebral blood flow. We use changes in blood flow as a proxy for neural activity, reasoning that as parts of your brain become more active they require additional nutrients like oxygen that are supplied by blood flow. Therefore, increases in the concentration of blood flow in different parts of your brain suggest that those areas are active.

fMRI is non-invasive. There is no surgery involved. Instead, you will be placed in a large magnet, and radiofrequency pulses will be used to measure the concentration of blood in different parts of your brain. We will obtain measurements of blood concentration while you perform experimental tasks that require you to pay attention to, remember, and make judgments about visual stimuli.

During some experiments, we may also use an infrared camera to track your pupil while you perform experimental tasks. We will use the location of your pupil – that is, what you are looking at – to measure what you are paying attention to.

Why are we asking you to be in this study?

The goal of this study is to understand how neurologically healthy adults perceive and attend to visual stimuli to perform visual tasks. We have no reason to expect that any experimental findings we obtain will vary across gender or people of different racial, ethnic, or cultural backgrounds. Therefore, there are no restrictions on study enrolment based on these

characteristics. Over the course of this study, we expect that approximately 20 people will participate.

You should *not* participate in this study if any of the following apply to you:

- You are pregnant or think you may be pregnant
- You experience claustrophobia (a fear of enclosed spaces)
- You tend to feel motion sick when viewing video games or movies depicting first-person motion
- You have any non-removable and ferrous (magnetic) materials in your body.
- You are under the age of 18, or under the appointed care of a legal guardian

What will you be asked to do if you agree to be in the study?

If you agree to be in this study, you will be asked to attend 2-6 study sessions, including one or more behavioral testing sessions and one to five fMRI sessions. You may be eligible to continue participation in further studies in the lab after this time, but we will ask for your consent again after five fMRI sessions. Study sessions will be conducted on the University of Nevada, Reno campus and at the Renown South Meadows Medical Facility, located at 10101 Double R Blvd, Reno, NV, 89521. You will be responsible for arranging travel to and from each study session. If you need help arranging transportation because of a disability, please bring this to our attention as soon as possible. We may be able to arrange disability access parking or other forms of assistance.

During behavioral testing sessions, you will meet with a member of the research team on the University of Nevada, Reno campus. One purpose of such sessions is to familiarize you with experimental tasks that you will perform while undergoing fMRI scanning. The experimental tasks require you to attend to, remember, and make judgments about visual stimuli rendered on a computer monitor by pressing buttons on a computer keyboard. During some tasks we will use an infrared camera to track your gaze; we use these recordings as an independent measure of what you are paying attention to, and to assess whether you are following task instructions. We anticipate that each training session will take 45-60 minutes, and you will be compensated for your time at a rate of $10/hour.

During fMRI sessions, you will meet with a member of the research team at the Renown South Meadows Medical Center where the MRI scanner is located. During these sessions you will perform the same tasks you performed in the preceding behavioral testing session while we obtain fMRI images. You will also be asked to complete additional tasks designed to identify specific brain areas that we are interested in measuring. During some tasks we will use an infrared camera to track your gaze in the same way as behavioral training sessions.

During fMRI sessions, you will lay on your back to be advanced into the MRI machine. A measurement coil will be placed around your head. A mold that has been custom made for your head may also be placed inside the head coil to minimize head movements (see below for more on this). You will view visual displays projected into the rear of the MRI machine via a mirror attached to the measurement coil and respond to stimuli using a button box that is similar to a video game controlle).

It is important that you remain very still during fMRI acquisition. Even small amounts of movements – like crossing and uncrossing your legs – can interfere with the operation of the MRI machine. You will have access to pillows, foam pads, and blankets to make sure that you are as comfortable as possible. You may also optionally use a head case (plastic or foam mold) for your head to help you hold still.

Due to loud noises produced by the MRI scanner, members of the research staff will obtain your images from a control room adjacent to the room with the MRI scanner. The research staff will be able to see you through a glass partition, and you will be able to communicate with the research staff via an intercom system. If you wish to stop a scan to communicate with the researchers and potentially stop the study, you will have a squeeze ball at all times; squeezing it will indicate to the operators that you wish to stop the current scan.

How long will you be in the study?

Each study visit will last 60 or 120 minutes, depending on the type of visit you are completing (see the previous section of this document).

Participation in additional experiments

This study consists of several interrelated experiments. You may be invited to participate in additional experiments after completing your initial study. If we invite you to participate in an additional experiment, we will explain all study procedures for you and we will ask you for your consent (i.e., you will be asked to review and sign a new copy of this form after we have explained the new experimental procedures to you). You can decline to participate in additional experiments, and you can withdraw from the study even if you have already agreed to participate. Declining to participate or withdrawing from the study will have no impact on any medical care you are receiving and will have no impact on your relationship with members of the research team.

Right to Refuse or Withdraw

You may refuse to participate or withdraw from the study at any time. Refusing to participate or withdrawing from the study will not affect any medical care you are receiving, nor will it impact your relationship with the research team. Any compensation you have earned before withdrawing from the study is yours to keep. If you withdraw from the study after data from the study has been publicly shared, your (anonymized) data will be removed from any online sites by which we have shared the data, but we cannot guarantee that all copies of it made by others will be deleted.

If we make any changes to the experimental protocols described in this document, we will inform you and ask for your consent again.

Discomforts, Inconveniences and/or Risks

Neuroimaging experiments are described as ‘minimal risk’ because there are very few risks in participating. These techniques are used safely all over the world, both by medical doctors and by researchers. If you feel pain or discomfort at any time during or after

participating in this experiment, please tell a member of the research team immediately!

To determine if it is safe for you to enter the scanner, you will be asked some questions relating to your medical history in a pre-screening questionnaire, including, importantly, whether you have any metal in your body. A copy of the screening form will be made available to you along with this consent form so you can see what specific questions will be asked. Your answers to this questionnaire will be shared with the MRI technicians at Renown to assure you are safe to be scanned, and thereafter your questionnaire will be securely stored in a locked drawer in our laboratory. If you do not wish to answer the screening questions, you should not participate in this study.

To obtain fMRI images, we will ask you to lay very still in a confined space for a long period of time (approximately 120 minutes). If you experience claustrophobia or confined spaces make you feel uncomfortable, you should not participate in this study. You may experience mild muscle pain or soreness caused by laying still for a long period of time. The research team will do everything possible to ensure your comfort – including offering you pillows, foam padding, and blankets.

It is very important to stay still while being scanned. In order to help you stay still, the research team will optionally create a mold for you that will fill the area between your head and the MRI head coil. This mold, which the research team calls a ‘head case’, will be made of plastic, foam, or some other smooth, light, rigid material. Use of this head case will be optional. If you choose to use it, it will hold your head firmly in place for the duration of the scan. The head case will be created based on a 3D scan of your head collected before your first scan session. The head case will be designed to comfortably support the back of your head, but for some individuals it may prove uncomfortable for long sessions or induce a sense of claustrophobia. Please let the researchers know if you experience discomfort at any time throughout the experiment.

It is also very important to follow instructions regarding eye movements (usually, to maintain fixation) in this study. For both behavior testing and fMRI sessions, we may collect eye tracking data to monitor your eye movements and wakefulness. This involves capturing videos of your eyes, which will contain images of your irises. Such images could possibly be used as a biomarker if paired with your identity. We will minimize potential risk to your privacy by storing these images securely and anonymizing any image that we display in publications or share with other researchers (see below).

During study sessions you may see videos depicting first-person motion. Such videos are known to make some people uncomfortable. Please let a member of the research team know if you experience any motion sickness or other discomfort. You will encounter all types of visual stimuli in behavioral testing sessions before going to the MRI scanner, and may stop either behavioral testing sessions or fMRI at any time if you are uncomfortable. You will not be asked to continue in the study if you experience motion sickness due to the stimuli, and you will be compensated for the time you have spent in the experiment.

Neuroimaging techniques are considered completely safe for both pregnant women and the fetus.

However, just to be completely safe you will not be allowed to participate in the study if you think you may be pregnant. There are no known long-term risks associated with being in a neuroimaging study.

Very rarely, it is possible that we may see something unusual in your brain during neuroimaging. Everyone has a unique brain, so unusual features may not be a sign of any disease or disorder. But, if we do see something unusual while you are participating in this study, you will be told immediately. We are not doctors and the images we use are not meant to be used to identify medical problems. We cannot give you any medical advice, but if you want to seek a doctor, we can provide you with all the neuroimaging information collected in the study. If you do not want to know about any unusual findings, you should not participate in this study.

What happens if you become injured because of your participation in the study?
In the event that this research activity results in an injury, treatment will be available. This includes first aid, emergency treatment, and follow-up care as needed. Care for such injuries – including any financial cost - are solely your responsibility.

Benefits

Your participation in this study will reveal new information about how the brain works, but you will not receive any kind of medical or health benefit from participating. Your choice to participate will not affect your normal medical care in any way.

Who will pay for the costs of your participation in this research study?

No costs are associated with participation in this study.

Will you be paid for being in this study?

You will receive financial compensation for your time participating in this study. You will be compensated at a rate of $10/hour for behavioral training sessions and $20/hour for fMRI testing sessions. You will receive your compensation at the end of each study session.

Confidentiality

Who will know that you are in in this study and who will have access to the information we collect about you?

Members of the research team, the University of Nevada, Reno Institutional Review Board, Renown South Meadows Medical Facility, the US Department of Health and Human Services (DHHS), and the National Science Foundation (who are funding this study) will have access to your study records.

How will we protect your private information and the information we collect about you?

We will treat your identity with professional standards of confidentiality and protect your private information to the extent allowed by law. We will do this by de-identifying all data obtained from you as a part of this study. Specifically, at the beginning of the study you will be assigned a

random coded identifier (a random word or alphanumeric code). All data we obtain from you as part of this study – including fMRI images, eye tracking data, and behavioral data - will be indexed using this code. An index linking your personal information to this code will be securely stored on a password-protected laboratory servers. Only members of the research team will have access to this index.
fMRI and MRI images obtained as part of this study will be de-identified by digitally removing the skin and skull from each image. Similarly, eye tracking data will be de-identified by extracting statistical information (e.g., gaze position, pupil size) from the infrared camera images.. Only de-identified data will be used in scientific presentations and publications produced by this research. That is, we will not use your name or other information that could identify you in any scientific presentations, reports, or publications that result from this study. Similarly, only de-identified data will be shared with other researchers.

De-identified data collected as part of this study will be publicly shared with other researchers via data repositories, including Open Neuro and the Center for Open Science. Data sharing allows other researchers to perform large-scale meta-analytic reviews and test hypotheses not anticipated as part of this study. De-identified data sharing is also required by many scientific publications and funding agencies.

De-identified data will be maintained in perpetuity. If your de-identified data is used in another study – whether by this research team or a research team at another institution – you will not experience any benefit. While unlikely, the use of your data may result in commercial profit, such as a product, material, or process. You will not be compensated for the use of your data.

Do the researchers have monetary interests tied to this study?

The research team and their families have no financial interests in the design or outcome of this study.

Whom can you contact if you have questions about the study or want to report an injury?

At any time, if you have questions about this study or wish to report an injury that may be related to your participation in this study, contact Dr. Mark Lescroart at (775) 682-6807.

Whom can you contact if you want to discuss a problem or complaint about the research or ask about your rights as a research participant?
You may discuss a problem or complaint or ask about your rights as a research participant by calling the University of Nevada, Reno Research Integrity Office at (775) 327-2368. You may also use the online *Contact the Research Integrity Office* form available from the *Contact Us page* of the University's Research Integrity Office website.

Agreement to be in study

If you agree to participate in this study, you must sign this consent form. We will give you a copy of the form to keep.

Participant's Name Printed

Signature of Participant | Date

Signature of Person Obtaining Consent | Date