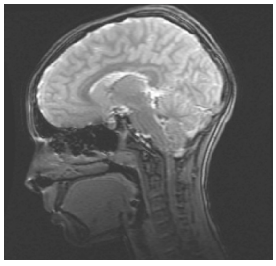
BUCNI NEUROIMAGING-CENTRE
BIRKBECK COLLEGE &
UNIVERSITY COLLEGE LONDON

At Birkbeck College, University of London and University College London we have a research centre, the Birkbeck UCL Centre for NeuroImaging (BUCNI) that uses magnetic resonance imaging (MRI) studies to look at how the brain develops. This technique has been very important in allowing us to understand how our brain works as we learn about the world we live in. We are currently looking for children of 6 – 12 yrs of age who would be interested in being a participant in one of our studies about how we develop our language and/or our understanding of the objects and the physical world around us.

During a visit to our centre parents and children get hands-on experience with high-tech scientific research and the children get to discover what their brain looks like. They take part in a series of small computer games and watch videos while we get pictures of their brain using the MRI scanner. We will give your child a video of what their brain looks like when the study is finished. You can visit the BUCNI to participate in one of our studies at a time that suits you best, like after school, in weekends or holidays. We will reimburse your travel costs and provide you with snacks and drinks during your visit.

To find out more about this research and find out what studies are currently running at BUCNI please contact us on the phone number or email below.

Centre for Brain and Cognitive Development
School of Psychology, Birkbeck College
32 Torrington Square
London WC1E 7JL
Phone: +44 07929 147613
E-mail: bucni@bbk.ac.uk



What is MRI/fMRI?

- fMRI stands for **f**unctional **M**agnetic **R**esonance **I**maging.
- You, your friends or maybe even your child may have had an MRI before - it is used in hospitals to measure all different parts of your body, for example if you have hurt your leg they might scan it to check what it looks like on the inside by using magnetic waves.
- MRI can be used to look at the anatomical structure of the brain and to look at how the brain works while we are doing different tasks, such as reading, listening, seeing or tasting.
- The MRI scan procedure is safe - these procedures are done hundreds of times a day all over the world.
- The MRI scanner makes loud noises whilst it is working – to block out this noise we will provide headphones so that our participants can concentrate on listening or watching the videos in the scanner.
- In order to get nice pictures of the brain, it is very important to keep the head very still. We will keep reminding your child of this throughout the study.
- Before the study starts we will explain everything to you and your child and answer any questions that you may have. We will also talk with your child throughout the study.
- Because MRI scans use strong magnetic fields, it is not safe to go near the scanner with magnetic metal. For example, people wearing piercings, clothes with metal that is not very securely attached or who have medical implants cannot go into the scanner room; zips on trousers are attached very well and are therefore not a problem but dangly earrings are. To make sure it is safe for your child to be in an MRI study, we will ask you some safety questions before the study. If you are not sure whether your child has metal in his or her body please tell this to the researcher.
- When the study is finished we will have made some very nice videos and pictures of what your child's brain looks like in action and we will send copies of these to your home.

We would like to emphasize that the participation in this research is voluntary and does not in any way affect your participation in other research at Birkbeck, or another university. Even if you decide to take part, you can withdraw at any time, without giving a reason. We will ensure prior to the scanning session, that only those individuals who are fully comfortable with this research will go ahead with the scan.

Tessa Dekker & Professor Marty I.Sereno

Birkbeck/UCL Centre for NeuroImaging
26 Bedford Way
WC1H 0AP, London

Email: tdekke01@students.bbk.ac.uk
Tel: 07515638869
0207 631 6242

Information Sheet for parental consent for minor in Research Studies

Object representations in the developing brain

This study has been approved by the UCL Research Ethics Committee, ref nr. 1690/001

Dear parent,

Thank you for your interest in our brain development studies at the *Birkbeck UCL centre for NeuroImaging at 26 Bedford Way, London*. We couldn't do our work without the help of enthusiastic children and parents.

If all the safety measures are adhered to, there is no risk attached to participating in this study. See the included information brochures on MRI for more information (the Pictorial guide and frequently asked questions sheet). It is very important that you read this information carefully and go over the MRI pictorial guide with your child so you both know exactly what to expect before you decide to take part in a study. If you agree to take part this will not oblige you to anything and you can withdraw at any time.

At our centre, we are interested in how the brain develops while children learn to make more sense of the world around them. Tools are special objects. Adults activate "grasping" areas in the motor parts of the brain, even when only looking at a tool without the plan to grasp it. Objects and their actions thus seem to be closely linked in the adult brain. We are investigating how such links develop when children grow up and get more hands-on experience with the world. This research can help us discover more about how children learn to interact with and experience objects. In the future this can offer a guidepost for designing optimal learning environments and treatments for developmental and acquired disorders that affect motor coordination and conceptual processing.

Research records will be kept confidential to the extent provided by law. The results will only be made public in scientific contexts and names will not be identified. During a visit, we will ask you to fill in a safety questionnaire to double check if it is ok for your child to go into the room with the scanner (e.g., there is no metal in or on their body) After the researcher has explained exactly what is going to happen and your child would like to take part, we will ask you to sign a parent consent statement. We will ask your child to sign a form too (see the included "child assent form"). Please remember that after signing, participation is still entirely voluntary. You or your child may stop the session at any time.

During the study, children are asked to do a few easy games in the MRI scanner and on a computer afterwards. We will also make a nice picture of their brain structure while they watch a cartoon. After your visit, we will send you this picture. The total visit will last about two-and a half hours. We greatly appreciate the commitment you make to our research and will compensate you for your expenses and provide snacks and drinks.

Please contact Tessa Dekker at **07515638869** or email to **bucni.cbcd@gmail.com** for more information, to make sure your child meets all safety criteria (see the FAQ sheet for more info) and perhaps to make an appointment for a visit to our center! We are looking forward to hearing from you,

Tessa Dekker

On behalf of the BUCNI team

All data will be collected and stored in accordance with the Data Protection Act 1998.
For full record see www.ico.gov.uk/what_we_cover/data_protection/legislation_in_full.aspx

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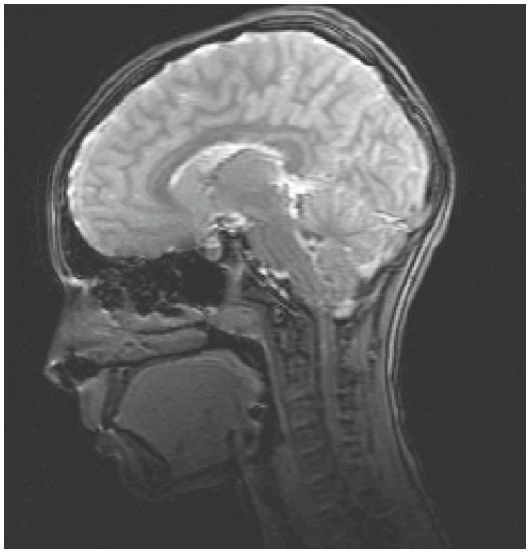

MRI: Information sheet and frequently asked questions

What is MRI/fMRI?

MRI stands for **M**agnetic **R**esonance **I**maging, or **f**unctional **M**agnetic **R**esonance **I**maging. MRI is used to examine the anatomical structure of the brain, while fMRI looks at the functional activation in the brain. fMRI can provide us with important information regarding the localization of different functions in the human brain, such as for example the areas that deal with visual information. fMRI is based on the assumption that neuronal activity in the brain is coupled with haemodynamic activity (the local control of blood flow and oxygenation). This means that the more active a brain area is, the more oxygen it will consume. It is because of this consumption of oxygen, in a particular neural tissue, that its magnetic properties change, thus making it detectable for us. Hence, this method allows us to detect the brain areas that are related to cognitive tasks. The major advantage for using this method is the very good spatial resolution and the non-invasiveness of the method, allowing

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for the acquisition of images of the living brain and of possible anatomical localizations of cognitive functions in the brain.

Who can participate?

To participate in this study, participants must not have any metallic implants or braces. Participants who take prescription medications on a regular basis should check with the study team about their suitability for this research. The MRI scan will involve being in a small closed space. It can be quite noisy although we will provide you with earphones. However, if you are claustrophobic (afraid of small spaces or do not like loud noises) then MRI may not be suitable for you. Again, please check with us if you are unsure.

Are there any side effects involved with MRI scanning?

The technique of Magnetic Resonance Imaging has been in use in medicine for about 20 years, and there are no known side effects of being scanned. MRI does **not** involve any radiation. In some people, there are times when it is not safe to be scanned. For example, in the first three months of pregnancy, or when there are surgical clips inside the brain, or if there is a heart pacemaker fitted. We have a safety questionnaire that is enclosed with this information sheet so that we can be sure that it is completely safe for you to be scanned. Please review this questionnaire, and tell us if you have any of the conditions, which are listed. We will be happy to discuss this with you. The scientists who operate the scanner will also check that you are safe to be scanned when you come to see us.

What are the possible disadvantages & risks of taking part?

Unless you are afraid of small spaces or loud noises, there are none. However, because we will be taking pictures of your brain, we may very rarely come across unexpected findings. The pictures of your brain are reviewed by experienced doctors, called neuroradiologists who specialise in looking at pictures of the brain and spine. If there are any unexpected findings that need further tests, he/she will write to your GP in the first instance. The GP will then contact you if further tests are required. This is why your GP details are required in the consent form.

What are the possible benefits of taking part in this research?

Although there are no immediate benefits to the participants, you will be helping with vital research into understanding how a healthy human brain works. If we gather more information on how the healthy brain works, we may be able to help people with brain abnormalities in the future. However, we will not be able to tell you specific info about your results.

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Confidentiality

All information that is collected about you during the course of research will be kept strictly confidential. Only researchers who are conducting your study will have access to your individual data. Any information about the MRI scanner and related documents will have your name and address removed so that you cannot be recognized from it.

We are by law required to notify your GP if the consultant neuroradiologist finds anything unusual in the brain scan. However, such instances are extremely rare and we do not anticipate that we will end up having to disclose such information.

What will happen to the results?

You will not be identified personally in the results, because your results will be combined with those of other participants as a group. We will write up the findings of the study including the group results into a paper and send it for publication in a scientific journal.

Your expenses

We will reimburse you for the time you take to participate in our research.

What you should know

We would like to emphasize that the participation in this research is voluntary and does not in any way affect your participation in other research in the Birkbeck Psychology Department, or another university. Even if you decide to take part, you can withdraw at any time, without giving a reason. We will ensure prior to the scanning session, that only those individuals who are fully comfortable with this research will go ahead with the scan. Finally, all of the information collected and presented as a result of this research is confidential.

Contact Information

If you have any questions about this research after being scanned, you can contact us any time for further discussion on any aspect of this study. Please see Information and Consent sheet for contact details.

Common Magnetic Resonance Imaging (MRI) Questions and Answers

Is an MRI or functional MRI (fMRI) safe? Are there any risks? There is very little risk and discomfort when safety guidelines are closely followed. Instead of using radiation to form an image (as with X-rays), MRI uses magnetic fields and radio waves. Both magnetic field and radio wave exposure is safe for most people, unless your child has metallic implants or devices. This is because the MRI machine generates a very powerful magnetic field, which

may draw metallic items or implants towards it or cause medical devices to malfunction. If you have any metallic implants or medical devices, you will not be allowed to participate. Some people are claustrophobic (i.e. afraid of small spaces) which makes MRI an unpleasant experience for them.

If I move while I am being scanned, will I be injured?

There is no risk of injury if you move, but the images we take will be blurred. For this reason, we will ask you to stay as still as you can.

If you find something concerning on the scan, will you let me know? Can I pass on the images from the scan to my neurologist?

We will review all the images we collect and if there is an indication of anything unusual we will get a consultant neuroradiologist to take a look at the scans. In the unlikely event that something unusual is found in the scans, the neuroradiologist at UCL will let your GP know. However, because the scans are being done for research, they are not optimized to detect abnormalities and this is why we contact the GP so that they can offer you follow-up.

Can I stay on my regular medication (e.g., stimulant, antidepressants, mood stabilizer) and still receive a scan?

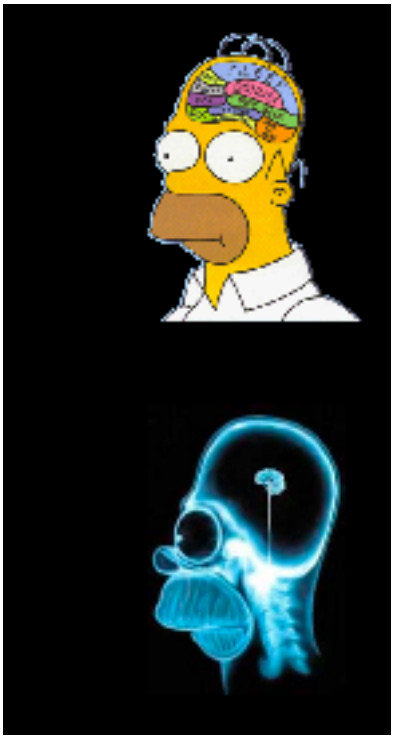
Although we prefer that participants in this study should not be currently taking any medications, there is no risk associated with taking medication and receiving a MRI. If you are on medication, we will need to discuss the suitability of you performing any tasks under medication.

A Pictorial Guide to FMRI

By Fiona Richardson, Amanda Brennan & Alice Grogan

Thank you for volunteering for a brain scan! Without you we would not be able to find out how the brain works. The aim of this guide is to give you an idea of what to actually expect when you come for your scan.

• When you come for your brain scan, we will take two types of brain images:



The **functional** scans help us to understand what parts of your brain are involved in different types of tasks. During these scans you'll be asked to carry out certain tasks (such as listening, or reading) when inside the scanner.

The **structural** scan gives us a very detailed picture of your brain anatomy. You do not need to do anything during this scan. We will send you a copy of your brain image after you've had your scan.

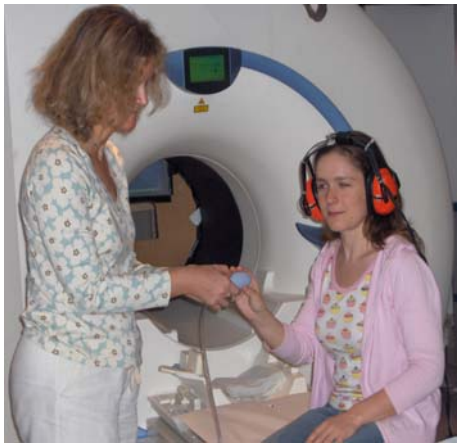
• When you arrive at the BUCNI Neuroimaging-Centre a researcher will train you on the tasks they would like you to do inside the scanner during the **functional** scans.

• After this the researcher will take you to the scanner to have your brain scan...

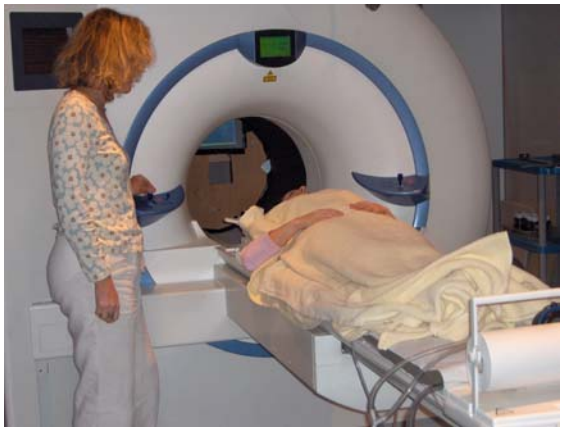
• When you arrive you will be asked to take off any jewellery. You will need to check your pocket for coins or any metal objects. Your valuables can then be placed in a secure locker.

- We will go through your MRI safety questionnaire and check your consent form to check it is okay to put you in the scanner. If you need to wear glasses we will provide you with a pair that are suitable to wear inside the scanner.

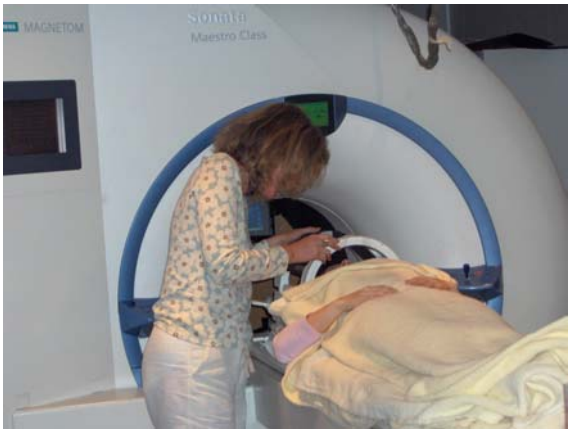
- Once you've checked your pockets again for any coins or metal objects we will take you into the scanning room.



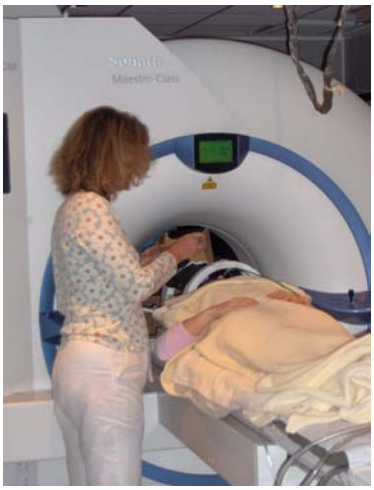
- We will give you a pair of earphones to wear, as the scanner is noisy. We will play sounds to you through these earphones too. You'll also be given an alarm bell, which you can press if you need to come out of the scanner at any time.

- We'll get you comfortable on the scanner table.

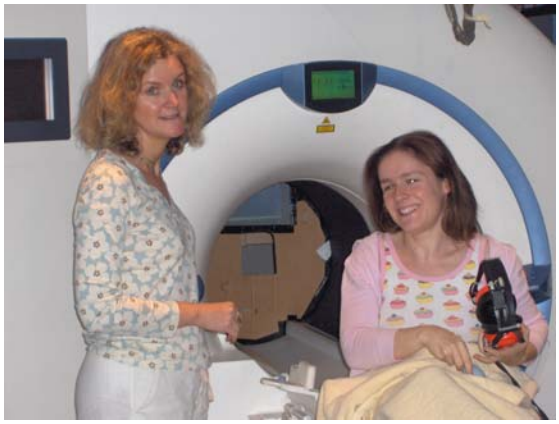


- We place a coil over your head. This is so we can receive the pictures that the scanner will take of your brain *(it's a bit like a TV aerial).*

- We will give you a microphone, and a mirror so that you'll be able to see the projector screen when you're inside the scanner.

- When you are inside the scanner we will position a camera so that we can see you moving your hand. You will then be ready to have your brain scan.



- When you've finished having your scan...

- You will have the opportunity to see your brain!

Child information sheet and assent form for research studies

Hello there!

We (Tessa and Professor Marty) are doing a neuroimaging study to find out what happens in children's brains when they look at and play games with pictures of things like tools and animals. This study will help us scientists understand how you and other children see and learn about the world around you. We would like to ask you for your help with this study. If you would like to help us, this is what you would do:

What to expect when you come for your brain scan

- When you visit to our research centre you will be asked to do **computer-games** while we take **pictures of your brain (brain-scans) while you are lying down in an MRI scanner**. Don't worry, we will practise the games with you before you enter the scanner and all will be clear to you!
- Each brain-scan lasts no longer than 4 and a half minute (except for one that lasts 10 minutes while you watch a cartoon)
- Like with a photo-camera, it is important to lie **very still** so we can take good pictures of your brain.
- It is **noisy** inside the scanner, so we will ask you to wear **headphones** to protect your ears
- There will also be a microphone inside the scanner, so that we can talk to you the whole time
- You can tell us if you want to **stop whenever you want to** and we'll stop immediately.
- We may show the pictures to other scientists to tell them about how children see and learn about objects but we will never tell anyone it is your brain in the picture.

Your parents have said it is OK if you take part in this study. You **do not** have to help in this study **unless you want to**. If you decide to do this study, you can change your mind later and say no without having anything bad happen as a result.

Put a tick by the answer you want:

☐ **Yes, I want to be in the study.**

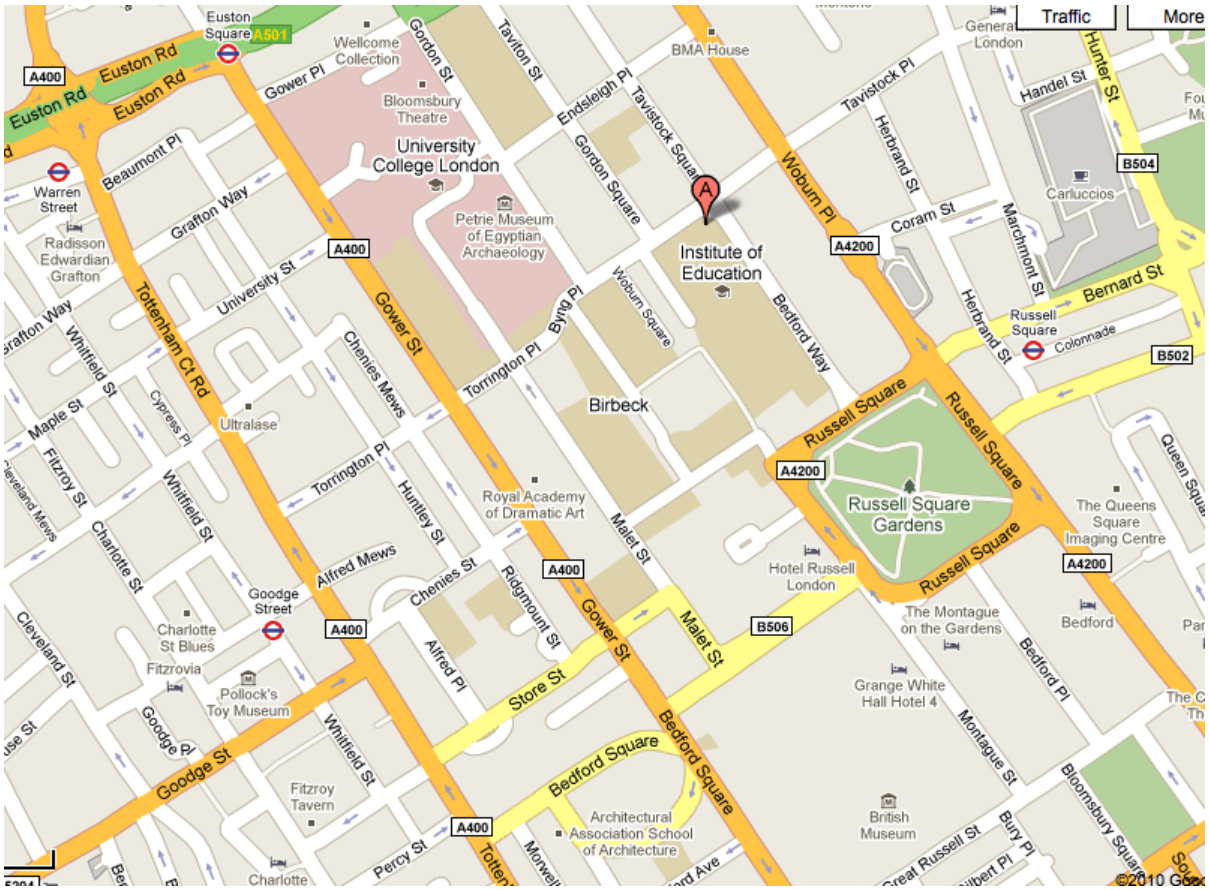
☐ **No, I do not want to be in the study.**

Your name:_____

Date:_____

Important: how to get to the Birkbeck/UCL Centre for NeuroImaging

Address: 26 Bedford Way, London, WC1H 0AP, United Kingdom



BUCNI (see A) is located on the basement floor of 26 Bedford Way, WC1H 0AP.

The UCL building on the corner of Bedford Way has a stairs in front of the entrance. There will be a receptionist inside who will let you through the little gates and can help you find the neuroimaging center. To find us, you take the lifts to the basement. Out of the lift, turn right and right again into the hallway (just follow the signs). The BUCNI safety protected door with window and intercom are at the end of the hall on the left. Please ring us and we will let you in.

The closest tube stations are: Russell Sq, Euston Station, Euston Sq, Warren St & Goodge St. The closest rail station is Euston Station, with Kings Cross and St Pancras also within walking distance. If you have difficulties finding us or are arriving at a Sunday and there is no one at reception, please call: 07515638869, or reception at (0)20 7679 5475 and we will come and pick you up.

WE'RE LOOKING FORWARD TO SEEING YOU AT THE BUCNI