MetaLab Manual

https://metacoglab.org

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1 Introduction

Welcome to the MetaLab at the Wellcome Centre for Human Neuroimaging (WCHN, or FIL as it's often known). We hope you have an excellent and productive time during your stay in the lab!

This lab manual was developed by lab PI, Steve Fleming, together with lab manager Oliver Warrington, and is a rough outline of how Steve expects the lab to function within the wider WCHN and UCL infrastructure (who's rules and policies should take precedence). It's inspired by several others (for instance here and here, and particularly Marian Aly's lab manual).

If you can think of anything that is missing, or things that are unclear, then please let us know - ideas are always welcome!

2 Getting started

On your first morning you will be met by one of the reception team at the FIL. They will arrange for you to have a building induction, introduce you to key people, get your access card and show you to your desk. There are a few things you need to do within your first few weeks for both UCL and the lab, see below for a checklist. If there is anything you seem to be missing, please ask Oliver or Steve and we'll point you in the right direction.

General checklist:

- Building induction
- Access card
- IT induction
- Fire safety walkthrough
- Mandatory UCL staff moodle courses
  - DSE assessment
  - Diversity
  - Fire safety
  - Freedom of information
  - Data protection
  - Information security
- Scanning safety session (if you'll be doing any scanning with us)

Lab Checklist:

- Make sure you have been added to:
  - Google calendar
  - Dropbox
  - Consciousness Club mailing list (email Oliver)
  - Github
  - MetaLab people page
- Have a browse through the FIL intranet
- Make a start on the key readings (See section 10)

3 Reading

To build a common knowledge base for everyone in the lab, we recommend reading the following papers:

- How to measure metacognition - Fleming & Lau 2014
- The neural basis of metacognitive ability - Fleming & Dolan 2012
- Metamemory: A theoretical framework and new findings - Nelson 1990
- Experimental and theoretical approaches to conscious processing - Dehaene & Changeux 2011
- Empirical support for higher-order theories of conscious awareness - Lau & Rosenthal 2011

4 Meetings

The MetaLab runs the Consciousness Club meetings where guest speakers from a range of disciplines come to discuss all things consciousness- and metacognition-related. These meetings are held at 11am every Wednesday in the 1st Floor Boardroom.

Every Friday the FIL holds project presentations from our colleagues in the building at 2pm and talks from external speakers at the Brain Meetings straight after. These are valuable meetings and it is highly recommended that all MetaLab members come along each week. These take up most of Friday afternoon so plan accordingly!

Finally, every other week we have our lab meeting held on Friday at 1130am. Check the lab calendar regularly for updates.

5 Expectations and responsibilities

There are a few general things to keep in mind:

- Do work you're proud of, and seek the respect of those who you respect.
- Give yourself time to think and try not to be busy just to seem busy. Amos Tversky tells us that "The secret of doing good research is always to be a little underemployed".
- Be careful and don't rush. Double and triple check your work, and try to incorporate sanity checks in your analyses.
- Perfect coding is as unrealistic as perfect prose - we all make mistakes. Just make sure to tell your collaborators as soon as possible so we can correct them and move on.
- Honesty is always the best policy - never be tempted to fudge results.
- There are two ways of interacting with your peers and colleagues. One is to look to them for useful advice and support; the other is to worry and despair that they're all doing well and you're not. Try to do more of the former than the latter.
- If you're struggling, professionally or personally, feel free to speak to Steve in confidence. Your health and well-being come first.

5.1 Code of conduct

The lab, and the university, is committed to ensuring a safe, friendly and accepting environment for everyone, and is an environment that must be free of harassment and discrimination. If you notice someone being harassed, or are harassed yourself, tell Steve immediately. If Steve is the cause of your concern, then have a word with the Head of Department or another trusted faculty member.

UCL has a very useful and comprehensive Research Staff Code of Conduct that we adhere to, downloadable here. This lays out expectations of both researchers within the lab, and Steve as the PI. Please make yourself familiar with its recommendations.

5.2 Authorship

In general, everyone making a substantial contribution to a project will have the opportunity to co-author the resulting paper. Early in the life of a project we will usually hold a meeting to explicitly discuss authorship expectations. If you are leading on data collection, analysis, and writing, the default position is that this will entail first authorship. Things get a little more complicated when these responsibilities are split, for instance if a Masters student project is being done in collaboration with a PhD student in the group. In cases such as these, please make sure to discuss your expectations about authorship with Steve earlier rather than later so that we can find a reasonable solution.

One caveat to the above is that if a substantial time period passes without a paper being completed after someone leaves the lab (after 2-3 years of finishing data collection), then we may need to reassign the project to a new first author. The policy here is to prevent rare and useful data from remaining unpublished, while giving a healthy window for writing the paper to the person who initially led the project.

6 Lab management

6.1 Hours

Being around the lab builds camaraderie, ensures we're always learning from and helping each other, and sparks ideas that you usually wouldn't have by staying home. However a benefit of academia is that the hours are generally more flexible than a regular office job. The primary concern is that you get your work done, and so if you feel you are sometimes more productive at home (when writing a paper, for instance), feel free to work at home on an occasional day when there are no scheduled meetings. If doing so, please drop Steve an email the day before to let him know that is your plan. In turn, Steve will make sure that his travel schedule / working-from-home plan is in the lab calendar, so that you will know when he is around to meet.

6.2 Annual leave

We encourage everyone to take holidays and breaks away from the lab. When you do go away, try to switch off your email – set an out of office message and remove it from your phone. Take a proper break.

To ensure you log your Annual Leave, ensure you ask Steve to sign off the relevant dates, and add it to the lab calendar so we know who is around and who is away.

7 Running experiments

7.1 Recruiting participants

We typically use the SONA system for subject recruitment. Before testing your first subjects, ask Steve or Oliver to help you set up a SONA account, and ensure that you have the right ethics documents and consent forms. *No testing or piloting should take place on a new project without first discussing with Steve.*

7.2 Booking testing rooms and scanning slots

The testing room and scanner diaries can be accessed via the WCHN homepage or the FIL Intranet. To book a room, follow the "How to book Testing Rooms" or the "How to book Scanning Slots" links on the intranet where you will find a link for a template email. Simply fill out the required details and send.

7.3 Cancellation

If you need to cancel slots for either behavioural testing or scanning please remember to make sure to inform the radiographers as soon as possible, to ensure the resource can be freed up for others. Please ensure that Steve is kept informed if you need to cancel scanning slots for any reason.

7.4 Retrieving the data

The scans will be available for collection the next day from Charm. Charm is the data server for the FIL and scans are stored indefinitely. There should be a shortcut for Charm on your desktop, if not, see the intranet on how to set that up.

The MetaLab has some core functions stored on GitHub for retreiving, organising and preprocessing data. Refer to the fMRI guide located there for more specific details.

8 Research skills

If you feel like you need to brush up on programming skills and statistics, please see Mariam Aly's lab wiki which has an extensive list of resources.

8.1 Open science

We committed to being open in our sharing of resources and data with others. Within the lab, you should share code and data with whoever you like, and you should aim to help others where possible with problems you've encountered and solved yourself in the past. Outside the lab, please check with Steve before sharing code and data with others. Generally, we will aim to make the code and data freely available around the time of publishing the associated paper, but there may be some exceptions to this general rule.

Reproducible research is an essential part of doing good science, and an expectation for all projects in the lab. For results to be reproducible, the analysis pipeline must be organised and well documented, and have a clear link to the raw data files (not preprocessed or otherwise modified versions of these files). This means keeping good notes throughout the design, data collection and analysis process, so that you can document the methods as part of the paper. It also means a healthy amount of commenting of your code.

Towards the end of a project, and before finalising a paper, there is an expectation that all relevant code to reproduce key results will be reviewed and uploaded the lab's Github. It is much easier to do this when you have been keeping track of the analysis pipeline throughout the lifecycle of the project.