Probabilistic Reward Learning and Decision Making Instruction Manual

General Instructions

Make sure subjects are comfortably sitting before the experiment. Emphasize to subjects that they should only press requested keys, as indicated in the instructions (and visualized by stickers on the keys).

Some short breaks are programmed into the experiments. If subjects need longer breaks, they should be taken between tasks during the instructions (instructions will not advance until subjects press a key).

Running the experiment

The running of the experiments has been automatized.

- Each session includes two tasks
- You will need to separately launch the program for each task. Don't forget to run the second task!
- Note: If any errors or program crashes occur, please make sure to refer to the Troubleshooting section at the end of this manual for proper handling.

To run a subject on the experiments:

- If Matlab is not running, open Matlab (orange icon in the task bar, or start menu, Matlab)
- In the command window, type the command `RunTasks`, then press Enter.

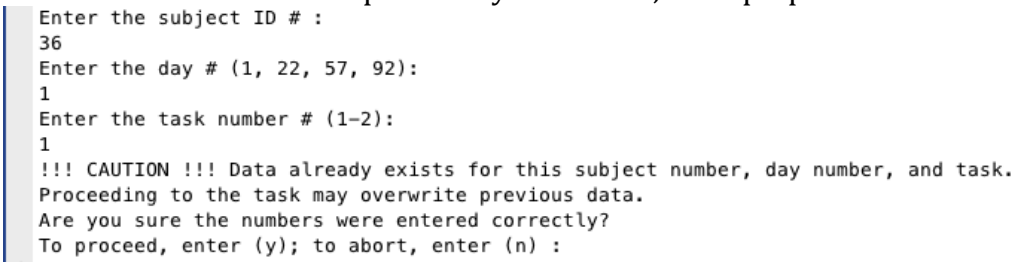
- The program will prompt for the subject number. **Enter carefully the subject's unique identifying number**, then press Enter.
- The program will then prompt for the day number (Day 1, 22, 57, or 92). Enter carefully the appropriate day number, then press Enter.
- The program will then prompt for the task number. Enter 1 to run the first task of the session (WM reinforcement learning experiment), and 2 to run the second task of the session (effort experiment); then press Enter.

- The program should then run on its own. Each experiment is preceded by instructions and practice. Subjects read through instructions at their own pace using instructed keyboard commands, and can read them more than once if needed**. Make sure to run both task 1 and task 2** for each subject and each session!

- The experimenter should be familiar with the task and stay with the subject for the instructions and practice part of each task (a few minutes each), ensure that the subject understands the instructions, and answer subjects' questions within the limits of the instructions. After practice, the experimenter should leave and let the subject perform the task on their own.

IMPORTANT:

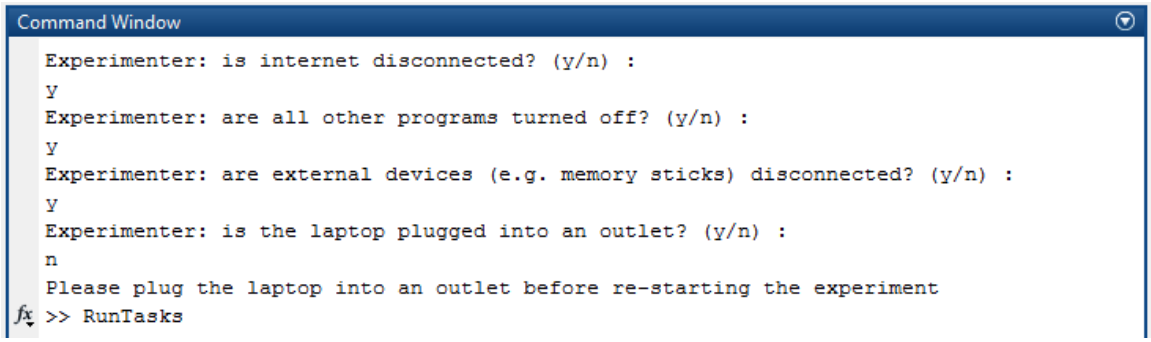
- The program specifically selects and runs a pre-determined version of the tasks each subject undergoes each day based on task number, day number, and subject number. **Be extra careful to enter these correctly!** If you enter numbers that have previously been used, the laptop will issue a warning:



- For optimal functioning of the software,

  - **PLEASE DO NOT CONNECT THE LAPTOPS TO THE INTERNET DURING RUNNING THE TASKS**,

  - **DO NOT LEAVE EXTERNAL DEVICES CONNECTED (SUCH AS USB MEMORY STICKS), AND MAKE SURE TO ONLY OPEN MATLAB (NO OTHER PROGRAM OR WINDOWS OPEN, INCLUDING FILE MANAGER).**



- Make sure the laptops are plugged in to a power outlet. The software will ask questions to ensure. Ensure y to continue to the task.

Do not delete or move any file or folder from the laptop unless directly instructed to do so!

Familiarize yourself with the tasks: A Demo for Experimenters

- A demo version of the tasks can be run by typing the command `RunTasksDemo`.
- This is not for actual subjects, but just for experimenters to get familiar with the tasks and the task running procedure.
- RunTasksDemo uses shortened experimental parts so that experimenters can get a sense of each part of the experiment without having to go through the entire session.

Immediately after running the experiment successfully

All files will be labeled based on subject ID number XX and session number Y.

1. **Quality control:** after a subject has gone through **both** tasks, the program will automatically check the collected data and perform tests indicating that the subject performed normally.

QC_ID72_Sess2.txt

```
Subject ID 72 session 2

Effort bonus: 5.535

QC Effort task:
PASS: Recovery of Effort file.
PASS: proportion of missed trials <0.2
PASS: proportion of same effort choices <0.85
PASS: proportion of same left/right choices <0.85

QC RLT task - learning:
PASS: Recovery of Learning file.
PASS: proportion of missed trials <0.2
PASS: Performance > 0.5

QC RLT task - testing:
PASS: Recovery of Testing data.
PASS: proportion of missed trials <0.2
PASS: proportion of same left/right choices <0.75
PASS: proportion of alternating choices <0.75
```

Example: file QC_ID72_Sess2.txt shows that the participant #72 passed all tests on day 22 (session 2), and that he won $5.54 bonus on the effort task.

2. The results of the tests are displayed in the text file QC_IDXX_SessY.txt [e.g., for subject ID 67 and session 2, QC_ID67_Sess2.txt], in the folder Documents/MATLAB/SummaryStatistics. Session numbers are 1, 2, 3 or 4, corresponding to day numbers 1, 22, 57, or 92, of the experiment. After the experiment, open this file and check it for PASS/FAIL. If any test is indicated as FAIL, the experimenter should take the following steps:
    a. Complete the 'PLT FAIL Worksheet' and send it to [annecollins@berkeley.edu] within 24h of the completion of the tasks. The worksheet will also need to be uploaded to the Valicert portal (see point 3. below)
3. Save the following files on a memory stick, and transfer them via Valicert (see instructions: [Transferring Task Files to Valicert]):
    a. In the folder Documents/MATLAB/SummaryStats:
        i. QC_IDXX_SessY.txt [Quality control file]
        ii. AllDataSXX_SessY.mat [Data file]
        iii. PLT FAIL Worksheet .pdf (if applicable)
4. The file QC_IDXX_SessY.txt indicates the bonus earned by the participant in the effort task at the top of the file.
5. In the case of a FAIL test your site PLT contact may be contacted by either Anne Collins or a Roche representative to discuss the case and potential corrective actions.

Transferring of Task Files to Valicert

What is Valicert (sFTP)

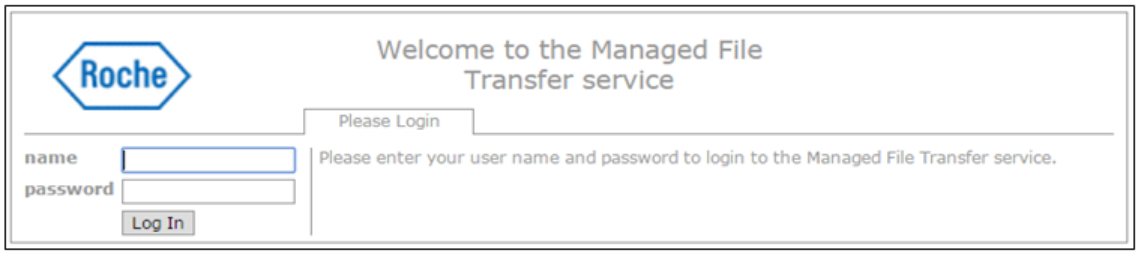
The Secure File Exchange System (also called as managed file transfer) allows Roche external partners, vendors and internal users to securely upload and download files (data) through the sFTP Servers.

How to access Valicert (using a Web Browser)

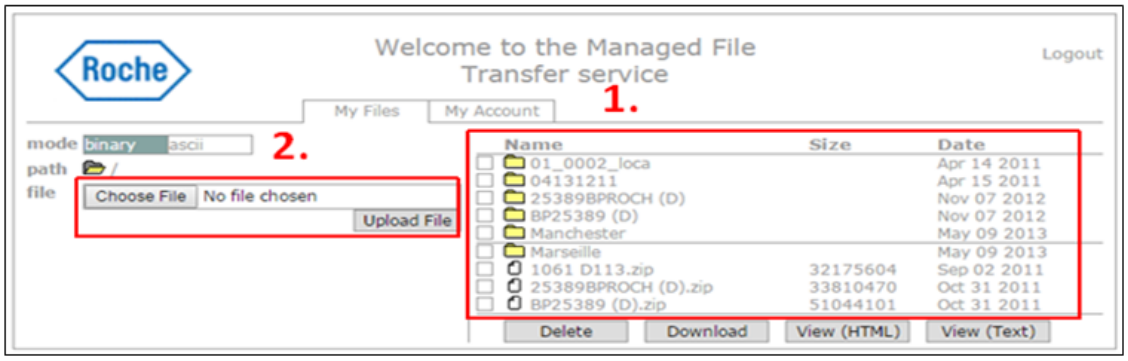
For accessing Valicert via NALA sFTP from Outside Roche Network:
https://mftnalaext.roche.com/

Connecting to Valicert using Internet Explorer:

After typing the above given Web link you should see this window. Here you type your User ID and your given password followed by pushing the Log In Button:



Now another window will open:



1. This is the window will represent the folder where your uploaded files will appear. ,
2. This is the window where you select the local files that you wish to upload. Click on Choose File and select the file you want to upload and push the Open Button. Now you see the selected file, which can now be uploaded by pushing the Upload File button.

Once the files have been uploaded they will then be accessible for a QC review by Roche personnel.

Valicert Important Points

- Internet browsers have a size limitation for data transfers of 2 GB.
- When working with web browsers, complete folders cannot be transferred. Only single files or zipped files. Folders cannot either be created.
- For using a Web Browser, we recommend Microsoft Internet Explorer.
- It is required to change the password yearly.
- The sFTP account will be locked after 5 failed login attempts.
- This is not a file storage service. There is a retention period of 60 days, after which the files will be automatically deleted. The environment must be used for file (data) transfer purposes only.

Troubleshooting

If a Matlab crash occurs during a task, copy the red error message in the console and save it into a document. Type the command [`save EWR1.mat`] in the command window (1 can be changed to any other number). Fill the "PLT technical problem report sheet", error message document, and the file "EWR1.mat" to annecollins@berkeley.edu. Make sure to gather as much information as possible about the crash, as specified in the report sheet.

In case there is a need to interrupt the tasks besides planned breaks or before the end, type the following commands (you won't be able to see what you type):

- [`Ctrl+c`] (this interrupts the program Matlab is running),
- then press [`Alt+Tab`] (this focuses Matlab on the command window, rather than the display window)
- then press `enter`, type [`sca`], and press enter (this closes the display window).

This should bring you back to the main Matlab command screen. Note that this is final! You cannot return to the task interrupted after that.

Please note that if you need to interrupt the learning task (task number 1), you should not restart it after an interruption, as interpretation of the data will be impossible. As a result, you should try to avoid interrupting the task as much as possible. If you need to interrupt the balloons effort task (task number 2), it is okay to restart it after an interruption if there is enough time left in the session.

In case of any problem, please contact annecollins@berkeley.edu.

PLT Technical Problem Report Sheet

Date:
Time:
Participant Number:

Please answer all following questions as precisely as possible.

1) Please copy the red Matlab error message here (see Troubleshooting in manual).

2) Did the experimenter perform the command [save EWRX.mat]? If so, please indicate X number, and confirm that this file was transferred via Valicert.

3) Which task did the technical problem occur in ("balloons" effort task, or learning task)?

4) If learning task, which part of the task did it occur in? Was the subject pressing keys to obtain points for single images, or was he picking between pairs of images? If possible, give an estimate of task duration up to the crash.

5) What happened right before the crash? What was the last display seen on the screen, what were the last keys or commands pressed?

6) Did you notice any unusual event on the laptop that might be linked to the problem? Please report any potential information of interest.

PLT FAIL Worksheet

Date:
Time:
Participant Number:

Please answer carefully all following questions:

1) Did the participant perform both tasks?

2) Was there a technical problem during any of the tasks? If so, please fill the PLT technical problem report file.

3) Did the experimenter monitor the subject during instruction phases of both tasks and ensure that the subject understood the instructions?

4) Did the participant show any signs of demotivation during the task, such as failing to participate, always pressing the same key, not paying attention, etc.?

5) Did the subject miss part of a task for any reason (had to leave, fell asleep, …)? If so, please give any relevant information.

6) Did you notice anything else unusual in the participant's behavior that might explain their unusual performance? Please give as many details as possible.