How to run MATLAB tasks

Task Directory: containing all the files mentioned henceforward.

/Users/jong/Desktop/midbrain\_pilots/

Task Presentation and Explanation PowerPoint

Task explained.ppt

1. Resting State

Displays a white crosshair in a dark background. Type in the following commands in MATLAB command window

>>cd RestingState

>>RestingState(-1)

The “-1” argument in the parenthesis after “RestingState” is to tell the program to hold indefinitely until a key is pressed. To quite the crosshair screen, press any key on the keyboard.

1. MID

Start the Money Incentive Delay task. Type in the following commands in MATLAB command window.

>> cd MID\_OSX

>> MID\_OSX

You will be prompted with the following options:

* Subject ID: enter subject ID number
* Which Block:
  + 1.Block 1: fMRI block 1
  + 2.Block 2: fMRI block 2
  + 3.Practice: practice session, to be used in the training session. Subject is supposedly left alone in the room to perform the entire task.
  + 4.Demo: demonstration, to be used in the training session. To be used after explaining the task to the subject
  + 5.Debug: for fixing the script
* Baseline (ms):
  + If this is a practice session
    - If Control: 300
    - If Patient: 400
  + If this is an fMRI session, assuming that a practice session is done
    - If Block 1
      * If subject wins around $10~$20: Use the average RT from practice
      * If subject wins more than $20: Use average RT from practice minus 50
      * If subject wins less than $10: Use average RT from practice plus 50
    - If Block 2
      * If subject wins around $10~$20: Use the same RT as in Block 1
      * If subject wins more than $20: Use Block 1 RT minus 25 (negotiable)
      * If subject wins more than $30: Use Block 1 RT minus 50 (negotiable)
      * If subjects wins less than $10: Use Block 1 RT plus 25 (negotiable)
      * If subjects loses money: Use Block 1 RT plus 50 or more (negotiable)
  + Healthy controls are usually around the 300 ms, whereas patients are a little bit slower, but not always. It is a judgment call.
  + **Do not ever exceed 850ms.** A baseline of 850ms should almost guarantee that every single trial can be answered correctly.
* Keyboard Input Device Number:
  + There will be a list of devices provided.
  + If fMRI session
    - Look for the correct keyboard input device (response box device)
  + If practice on computer
    - Enter as “-1”
* Which mode of triggering is used?

1). Task triggers scanner via USB;

2). Task triggers scanner via Serial Port;

3). Scanner triggers task via USB;

4). Scanner triggers task via Serial Port.

* + Enter “2” for fMRI session and “3” for any practice or demo.
  + If serial port failed (if forgot to plug in the serial port), the script will display a list of available serial ports. Type in the correct port to continue the program. Otherwise, double check if you have plug in the trigger port correctly, then press “Control”+“C” to kill the script, and restart it again.
* TTL pulse Input Device Number: will only show up when selecting triggering mode “3” in the previous step. Simply enter “-1”.

An alternative way to start the script is using it as a function. Check the help documentation for MID\_OSX for explanation by typing

>> help MID\_OSX

Example usage is the following:

%run first fMRI session

MID\_OSX(subject\_ID,’1’,baseline\_RT);

An easier way to start the program is to use the script MID\_main.m. The script is very self-explanatory.

1. Frac-Back

Start the Fractal-N-Back working memory task. To start the script, type the following commands in the command window.

>> cd FracBack\_OSX

>> FracBack\_OSX

The prompts are very similar to the ones we had with MID task.

* Subject ID: enter subject ID
* Session type? 1=fMRI, 2=behave, 3=ZeroBack, 4=OneBack, 5=TwoBack
  + 1=fMRI: for fMRI session. Will run 3 blocks all together
  + 2=behave: for behavioral training. The block condition will alternate. This will run one block
  + 3=ZeroBack / 4=OneBack / 5=TwoBack: for behavioral training. Used such that subject can practice on only one block condition
* Self Paced?[0 | 1]: this will only show up if we choose session type to be 2, 3, 4, or 5 (all the practice sessions). If true, the images will not disappear until subject makes a response.
* Keyboard Input Device Number: same thing as in MID
* Which mode of triggering is used? Select “2” for fMRI session, and “3” for practice and demo.
* TTL Pulse Input Device: same as in MID.

An alternative way to start the script is using it as a function. See the help documentation of FracBack\_OSX by typing

>> help FracBack\_OSX

Example usage is the following:

%run fMRI session

FracBack\_OSX(subject\_ID,1,[],[],[],false);

An easier way to start the program is to use the script FracBack\_main.m. The script is very self-explanatory.

1. Stop-Signal

Start the Stop Signal task. To start the script, type the following commands in the command window.

>> cd StopSignal\_OSX

>> StopSignal\_OSX

The prompts are very similar to the ones we had with MID and FracBack task.

* Enter subject ID number: enter subject ID. **If this is an fMRI session, make sure to use the same ID for the same subject!**
* Session Number? 1=Behavioral, 2=fMRI, 3=demo :
  + 1=Behavioral: for behavioral training. The block condition will alternate. This will run one block
  + 2=fMRI: for fMRI session.
* Enter run number (max is 3): which run to run. First two runs have stop signal beep, whereas the third run is a control run without stop signal beeps. **The third run is no longer used! (EDC 042414)**
* Which Order do you want to use, 1-4:Will only show up if this is the practice session. Enter 1.
* Ladder1 start val (e.g. 250): will only show up if this is a practice session. Enter as suggested 250
* Ladder2 start val (e.g. 350): will only show up if this is a practice session. Enter as suggested 350
* Keyboard Input Device Number: same thing as in MID
* Which mode of triggering is used? Select “2” for fMRI session, and “3” for practice and demo.
* TTL Pulse Input Device: same as in MID.
* Enter the name of prior behavioral file to open: Will only show up during fMRI session if the program cannot find a practice session file from the result folder. Double check your ID to match that of the previous behavioral session. It is also possible that there are multiple previous behave files existing. Enter the full name of the behavioral result file (including the .mat extension) to continue (double check for typo).
* Test beep volume

Good? (‘Q’ to quit):

* + Will show up during fMRI session to give an opportunity to ask the subject if the beep is loud enough (needs to be relatively louder than what the subject thinks is good, because of scanner loud noise). Adjust the volume of the laptop. Press “Enter” to replay the beep. Enter “Q” (press “Q” then “Enter”) to quit adjusting the volume.

An alternative way to start the script is using it as a function. See the help documentation of StopSignal\_OSX by typing

>> help StopSignal\_OSX

Example usage is the following:

%run first fMRI session

StopSignal\_OSX(subject\_ID,1,run\_num,[],[],inputDevice,2,TriggerDevice);

An easier way to start the program is to use the script StopSignal\_main.m. The script is very self-explanatory.