fMRI experiment (Hedgemaze)

Data deposited:

Trial-level data for 24 participants. Three participants (1, 8, 23) excluded because of excess head movement.

Trial-level data include:

* de-faced structural scans in folder ‘defaced anatomy’
* behavioural data in folder ‘hedgemaze csv’
* functional scans in zipped folders ‘hedgemaze\_XX\_fMRI data’

Notes on experimental protocol (full details in ethesis: <http://etheses.dur.ac.uk/13323/>)

* Nine-junction interconnected Y-maze with objects at each junction. Dual solution task: participants required to learn route to end – could use object identity and/or sequence of turns.
* Pre-training involved learning to reach the end without making an error. Criterion was two errorless runs. Then a series of three-junction segments of the full route starting at one of three different junctions in the maze, interspersed with full runs and a five-junction run that ended at the final location.
* Scanner protocol:
  + **Scanner re-training phase** until training criterion met, then sub-route runs as above.
  + **Short probes phase**: 4 runs of 24 trials, 18 of which were short (three-junction) probes: 6 x short sequence, 6 x short conflict, 6 x control trials. In addition, there were 6 x standard full route training trials. Trials were interspersed in pre-determined order. Short sequence probe = two-junction segment of full route with a single object at the first junction and no object at the second junction. Participants had to rely on knowledge of sequence to choose the correct path. Short conflict probe = two-junction segment of full route with an object at the first junction and an out-of-sequence object at the second junction. Participants could take the correct path relative to either the sequence (ignoring object) or object (ignoring sequence). Control probes = two-junction segment of full route with no objects present, and incorrect arms blocked off by fences.
  + After two short probe runs, the **structural scan** was taken.
  + **Long probes phase**: 4 runs of 6 long probes – 3 x long sequence, 3 x long landmark, in alternating order, counterbalanced among participants. Long sequence probe = a three-junction segment of the full route with a single object present at the first junction, with subsequent junctions having no objects. Participants had to rely on knowledge of sequence to choose the correct paths. Long landmark probe = a three-junction probe with landmarks presented in a random order. Participants were instructed prior to the probes which type of probe would take place and how to respond. For the long landmark probe: “we have changed the order of the landmarks from what you have learned. To make the correct decision at each junction, you need to base your decision on the direction you would have turned when you saw that landmark during the normal route”. For the long sequence probe: “you will see one landmark at the beginning of each trial, which you can use to tell where along the route you are. However, the other landmarks have all been removed from the environment. The route hasn’t changed though, so you can make correct choices at each junction based on what you have learned.”

Timestamped behavioural data correspond to fMRI scans as follows (where XX corresponds to participant number 01-27, excluding 01, 08, 23 for excessive head movement):

Scanner re-training phase

* pXX\_ScanTr.csv (behaviour) corresponds to dcm files in folder XX\_Run1\_Training

Short Probes phase

* pXX\_1\_ProbRun\_run1.csv (behaviour) corresponds to dcm files in XX\_Run2\_Short Probes 1 (fMRI)
* pXX\_2\_ProbRun\_run2.csv (behaviour) corresponds to dcm files in XX\_Run3\_Short Probes 2 (fMRI)
* pXX\_3\_ProbRun\_run3.csv (behaviour) corresponds to dcm files in XX\_Run5\_Short Probes 3 (fMRI)
* pXX\_4\_ProbRun\_run4.csv (behaviour) corresponds to dcm files in XX\_Run6\_Short Probes 4 (fMRI)

Long Probes phase

* pXX\_1\_FullPrbBlk\_S.csv or pXX\_1\_FullPrbBlk\_L.csv (counterbalanced order of S and L first) (behaviour) corresponds to dcm files in XX\_Run7\_Long Probes 1 (fMRI)
* pXX\_2\_FullPrbBlk\_L.csv or pXX\_2\_FullPrbBlk\_S.csv (counterbalanced order of S and L first) (behaviour) corresponds to dcm files in XX\_Run8\_Long Probes 2 (fMRI)
* pXX\_3\_FullPrbBlk\_S.csv or pXX\_3\_FullPrbBlk\_L.csv (counterbalanced order of S and L first) (behaviour) corresponds to dcm files in XX\_Run9\_Long Probes 3 (fMRI)
* pXX\_4\_FullPrbBlk\_L.csv or pXX\_4\_FullPrbBlk\_S.csv (counterbalanced order of S and L first) (behaviour) corresponds to dcm files in XX\_Run10\_Long Probes 4 (fMRI)

Structural scans in folder ‘defaced anatomy’ correspond to dcm files in folders ‘hedgemaze\_XX\_fMRI data’ as follows:

* XX\_Hedgemaze\_Run4\_Structural\_ISO\_defaced corresponds to XX\_Run4\_Structural