

The pipeline of DCM analysis

1. Extracting voxels of interest (VOI)

See the example script “voi_extractions_all_ROIs.m” under the codes folder.

2. Concatenating VOIs (multi runs)

Since we had two runs for disgust, we temporally concatenate each VOI for these two runs.

See the example script “concatenate_all_ROIs.m” under the codes folder.

3. DCM model specification

We specified individual DCM model that contains three conditions: main effect of disgust (i.e. genuine disgust + pretended disgust, no neutral conditions), genuine disgust, and pretended disgust. In this step, scans of two disgust runs that were concatenated correspond to the concatenated behavioral parameters in terms of conditions and timings. See individual behavioral data in the “log_files” folder.

4. Creating an DCM full model template

Since we did not have a specific hypothesis on the reduced model, thus we merely created a full model for each participant and then performed Bayesian model reduction (BMR) for each DCM parameter (model estimation). See how to create an individual DCM model (via GUI) step-by-step in references 1.

5. Replicating individual DCM files

We replicated other individual DCM model as reference to the DCM template we created in step 4. An example batch “re_es_DCM_files.m” could be found in the codes folders.

6. estimating individual DCM files

After model estimation, the completed individual DCM files were saved under the “individual DCM files” folder. The GCM files that contains all directories information to individual DCM file can be found under the “GCM_full_model_files” folder.

7. Second level DCM analysis

See scripts “Second_level_PEB_r_alns_l_olfac.m”, “Second_level_PEB_r_alns_r_olfac.m”, and “Second_level_PEB_r_alns_rSMG.m” in the codes folder.

References

1. [Step-by-step guide to DCM for fMRI and PEB](#)
2. [A guide to group effective connectivity analysis, part 1: First level analysis with DCM for fMRI](#)
3. [A guide to group effective connectivity analysis, part 2: Second level analysis with PEB](#)
4. [Neural dynamics between anterior insular cortex and right supramarginal gyrus dissociate genuine affect sharing from perceptual saliency of pretended pain](#)