

Normalizing Brains:

One difficulty we experienced with creating a group average map was normalizing the brains to a template and averaging values across that template. In the process of normalizing, voxels that were close to borders were widely variable across subjects, leading to inflated values in the group T2*map. However, feel free to try – this is what we did.

Normalization that takes place in 3 steps:

(1)SPM-Spatial-Coregister: Estimate

Reference Image is the one that does not move, and so this is the EPI set of data..since we delayed reslicing we only have a mean resliced image which is enough for this..that is the one that we will use for the reference image

Source Image is the one that does move, and so this is the subject's mprage (high resolution T1 image)

-this step estimates parameters that are needed to get the structural file into the EPI space
..this information is stored in the header of the structural file

(2)SPM-Spatial-Segment (here we want to take structural file which is to be placed in the EPI space and get the transformation values that I will need to put this structural file into a model (MNI) space)

Data, choose a dependency, here we choose Coreg:Estimate:Coregistered Images ..this is because we want to add this information to the header of the EPI file following the coregistration information. This gets written out in the directory of the struc but not in the header because it's non-linear transformation and this cannot be written out in a header We use the segment function because it seems to be better in getting the transformation values for normalisation when it separates the structural file into grey, white and CSF, then just doing the normalization..it seems to be an iterative process

Output files: Grey matter, choose Modulated + Unmodulated Normalised, and the same option for White Matter and CSF

(3)SPM-Spatial-Normalise:Write

Parameter file: Normalization parameters from Subject (structural scan in the EPI space) to MNI space

Images to write: i.e. which images do you want to be warped? These images must be in the same space as the "source" image, in our case structural image, so these must be our EPI images since at the end of the day these are the ones that we need in the normalized space..

Realign: Estimate & Reslice: Realigned Images (Sess 1) **these are the main ones that we are interested in, and the last ones we did anything on

- Realign: Estimate & Reslice: Mean Image ** the files that we need for further analysis, just to have a mean EPI that we can look at for further analyses
- Coreg: Estimate: Coregistered Images ...this is essentially to get a normalized structural