

Measuring Gray and White For Whole Brain Volume

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1. Transfer .csd file and 3d.msr file into your ID# labeled folder.
2. Open 3d.msr. Check to see if “Reverse Slices” has been checked. Open up images. Check to see if it is in “home orientation”, meaning that you are viewing the left side of the brain.
3. Calculate average sigma: Click on five different points on the right caudate and five points on the left caudate. At the bottom of the measure screen should be the number indicating the sigma value of each point. Record each number on an excel sheet called “Sigma Values”- you create this sheet, and calculate the average sigma. For example in a cell you would type:=AVERAGE(A1:A10), assuming that your sigma values were in those cells.
4. Go to “File” and click on “Mask Volume Data”. Create file name-whole.msk. Click “Save”. A small box will pop up asking you what filter value you want to use. Keep it at 0 which is already set as the default. Click “OK” and close the measure file. Save as whole.msr.
5. Open up your 3D filter program. The sigma value you calculated on your excel sheet is also known as the “K” value (at the bottom of the box). Copy this number into that space. You want to do 3 iterations (should be set as default).
6. Now, click on “Add” and find your folder in the C directory. Then click on whole.msk-it will not appear as a designated data file set so you need to type an * (asterisk), (hold down the shift key and hit 8), and hit return. That will bring up all files. Click on whole.msk now.
7. You will see an equation-whole.msk+whole.msr → whole.fil. Click “OK”.
8. Your brain will now filter through 3 iterations.
9. When it is done click OK.
10. Go to your Exploring window and double click on whole.fil. Open it again and then go to File and select “New Measure”.
11. Yes-you do want to use another measure as a template.
12. Click “OK” again.
13. Choose whole.msr and click on it.
14. If “Reverse Slices” was clicked, remove the check by clicking it off.
15. Hit Done.
16. Filtered, masked images should appear on the screen. Go to File and select New Measure.
17. No-you don’t want to save changes to the measure that is already open. (If there have been changes made to the brain, this step will be skipped.)
18. No-you don’t want a new template.
19. A small box of measurement types will appear; select volumes by Cavalieri. Click “Done”
20. The default grid setting is a 10x10x10 grid which you want to use. Got to “Calculate” and select “Combine Measure”. Select whole.msr and open it.
21. Yes-to continue
22. Yes-to continue

23. The combination window will appear. Choose In, Out, In, Out. Aka.Saved.
24. Open up your zoom-in lens and start at the beginning of the coronal sections check to see if the areas are brain or not brain. For a better view in which to measure, it may be necessary to view the brain in the front view only. To do this go to "View" and select "Front View". Use the 2/3 rule-if 2/3 of the boxes are brain, click it as in. If 2/3 are black click it as out. Be sure to save along the way and save it as total.msr.
25. Remember that what is considered brain excludes the midbrain, pons, medulla, spinal cord, and cerebellum. Everything located above the hypothalamus will be considered brain and should be kept as "in". Use the tiled views and click on points that you are unsure of to get a better idea of uncertain areas.
26. When you are finished go back to the beginning as start select gray and white using 2/3 rule. Remember to save as gray.msr and save along the way.