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**Data supplement**

**Method**

*Multiple Automatically Generated Templates (MAGeT-Brain) algorithm*

Traditionally, automated model based segmentation methods rely on the expert identification of

a neuroanatomical structure on a single well-defined template by a single rater or multiple raters

(1, 2). These types of segmentations may be limited in accuracy by errors in the transformation

estimation, irreconcilable neuroanatomical differences between the neuroanatomy of the

template and the subject, and resampling errors after the application of the transformation to the

labels. MAGeT-Brain limits these errors by using a "multi-atlas" based strategy while still

relying on a single well-defined template. To summarize the technique, five hippocampal atlases

detailed in (3) are used as input. The atlas is first customized to a subset of the dataset (21

subjects) using a nonlinear transformation estimated in a region-of-interest defined around the

hippocampus (1, 4, 5). This set of subjects now acts as a set of templates and all other subjects

are now warped to these templates. This provides 105 candidate segmentations for each subject.

The final segmentation is decided upon using a voxel-wise majority vote (i.e., the label occurring

most frequently at a specific location is retained) (6). In the original paper, strong overlap for

labels was demonstrated with those manually derived as well as with those automatically derived

using both FreeSurfer and FSL(7).

**References**

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**Table DS1** Hippocampal volumes at Scan1 and Scan2 for patient subgroups and controls. Data presented for FreeSurfer and MAGeT-Brain

| | | N | Mean | SD | SE | Minimum | Maximum |
|---|---|---|---|---|---|---|---|
| FreeSurfer | | | | | | | |
| Right, Scan1 | Refused-APs | 13 | 3450.8 | 567.8 | 157.5 | 2613.5 | 4632.1 |
| | Risp/Palp | 24 | 3567.4 | 389.0 | 79.4 | 2944.6 | 4741.7 |
| | Olanz | 12 | 3499.4 | 359.0 | 103.6 | 2874.2 | 3933.5 |
| | Aripip | 13 | 3564.5 | 296.5 | 82.2 | 3066.2 | 4179.1 |
| | Control | 44 | 3479.9 | 333.1 | 50.2 | 2988.2 | 4555.0 |
| | Total | 106 | 3508.7 | 375.4 | 36.5 | 2613.5 | 4741.7 |
| Left, Scan1 | Refused-APs | 13 | 3315.8 | 519.1 | 144.0 | 2528.4 | 4388.9 |
| | Risp/Palp | 24 | 3486.5 | 364.7 | 74.4 | 2887.6 | 4507.9 |
| | Olanz | 12 | 3388.1 | 332.4 | 95.9 | 2831.1 | 3766.3 |
| | Aripip | 13 | 3484.3 | 341.0 | 94.6 | 2880.4 | 4040.2 |
| | Control | 44 | 3359.6 | 289.6 | 43.7 | 2782.8 | 4083.8 |
| | Total | 106 | 3401.5 | 351.1 | 34.1 | 2528.4 | 4507.9 |
| Right, Scan2 | Refused-APs | 13 | 3415.9 | 547.7 | 151.9 | 2607.9 | 4602.5 |
| | Risp/Palp | 24 | 3566.1 | 376.0 | 76.8 | 2911.4 | 4747.6 |
| | Olanz | 12 | 3486.8 | 399.1 | 115.2 | 2806.4 | 4065.8 |
| | Aripip | 13 | 3635.6 | 274.9 | 76.2 | 3150.8 | 4207.8 |
| | Control | 44 | 3474.1 | 338.0 | 51.0 | 2922.0 | 4667.5 |
| | Total | 106 | 3509.0 | 376.5 | 36.6 | 2607.9 | 4747.6 |
| Left, Scan2 | Refused-APs | 13 | 3331.8 | 530.0 | 147.0 | 2604.8 | 4496.1 |
| | Risp/Palp | 24 | 3480.3 | 351.8 | 71.8 | 2871.1 | 4481.8 |
| | Olanz | 12 | 3379.7 | 304.5 | 87.9 | 2826.7 | 3710.2 |
| | Aripip | 13 | 3553.9 | 311.9 | 86.5 | 3029.0 | 4148.4 |
| | Control | 44 | 3358.2 | 295.0 | 44.5 | 2758.0 | 3985.2 |
| | Total | 106 | 3409.0 | 348.3 | 33.8 | 2604.8 | 4496.1 |
| MAGeT-Brain | | | | | | | |
| Right, Scan1 | Refused-APs | 13 | 2397.7 | 406.6 | 112.8 | 1884.0 | 3298.0 |
| | Risp/Palp | 24 | 2493.1 | 274.9 | 56.1 | 2047.0 | 3138.0 |
| | Olanz | 12 | 2479.3 | 285.2 | 82.3 | 1824.0 | 2783.0 |
| | Aripip | 13 | 2529.2 | 236.9 | 65.7 | 2177.0 | 2942.0 |
| | Control | 44 | 2456.8 | 234.9 | 35.4 | 1921.0 | 2971.0 |
| | Total | 106 | 2469.2 | 272.5 | 26.5 | 1824.0 | 3298.0 |
| Left, Scan1 | Refused-APs | 13 | 2469.8 | 412.9 | 114.5 | 1951.0 | 3370.0 |
| | Risp/Palp | 24 | 2535.2 | 304.8 | 62.2 | 1957.0 | 3315.0 |
| | Olanz | 12 | 2515.3 | 234.4 | 67.7 | 2170.0 | 2872.0 |
| | Aripip | 13 | 2581.5 | 254.1 | 70.5 | 2179.0 | 3002.0 |
| | Control | 44 | 2481.8 | 231.4 | 34.9 | 1966.0 | 3115.0 |
| | Total | 106 | 2508.4 | 276.1 | 26.8 | 1951.0 | 3370.0 |

| Right, Scan2 | Refused-APs | 13 | 2395.9 | 401.3 | 111.3 | 1911.0 | 3302.0 |
| | Risp/Palp | 24 | 2486.8 | 282.7 | 57.7 | 2051.0 | 3144.0 |
| | Olanz | 12 | 2473.2 | 291.5 | 84.2 | 1808.0 | 2863.0 |
| | Aripip | 13 | 2559.3 | 239.7 | 66.5 | 2139.0 | 2978.0 |
| | Control | 44 | 2462.4 | 234.9 | 35.4 | 1960.0 | 3003.0 |
| | Total | 106 | 2472.8 | 275.2 | 26.7 | 1808.0 | 3302.0 |
| Left, Scan2 | Refused-APs | 13 | 2486.4 | 387.0 | 107.3 | 1968.0 | 3288.0 |
| | Risp/Palp | 24 | 2546.9 | 309.8 | 63.2 | 2012.0 | 3380.0 |
| | Olanz | 12 | 2487.1 | 234.2 | 67.6 | 2083.0 | 2829.0 |
| | Aripip | 13 | 2614.0 | 222.0 | 61.6 | 2266.0 | 2958.0 |
| | Control | 44 | 2488.4 | 223.1 | 33.6 | 2015.0 | 3079.0 |
| | Total | 106 | 2516.7 | 268.0 | 26.0 | 1968.0 | 3380.0 |

**Table DS2** Correlations at Scan1 and Scan2.

| **At Scan1** | | | | |
| --- | --- | --- | --- | --- |
| | SAPS Total | | SANS Total | |
| | r | *P* | r | *P* |
| FreeSurfer | | | | |
| Left | -0.095 | 0.467 | -0.237 | 0.066 |
| Right | -0.058 | 0.655 | -0.286 | 0.025 |
| Total | -0.078 | 0.552 | -0.267 | 0.037 |
| | | | | |
| MAGeT-Brain | | | | |
| Left | -0.026 | 0.845 | -0.176 | 0.175 |
| Right | 0.011 | 0.935 | -0.168 | 0.194 |
| Total | -0.008 | 0.953 | -0.175 | 0.178 |
| | | | | |
| **At Scan2** | | | | |
| | SAPS Total | | SANS Total | |
| | r | *P* | r | *P* |
| FreeSurfer | | | | |
| Left | -0.070 | 0.590 | -0.086 | 0.507 |
| Right | -0.033 | 0.801 | -0.105 | 0.420 |
| Total | -0.052 | 0.690 | -0.098 | 0.453 |
| | | | | |
| MAGeT-Brain | | | | |
| Left | -0.061 | 0.643 | 0.006 | 0.964 |
| Right | 0.011 | 0.932 | 0.030 | 0.818 |
| Total | -0.025 | 0.849 | 0.018 | 0.888 |

Abbreviations: SAPS, Scale for the Assessment of Positive Symptoms;
SANS, Scale for the Assessment of Negative Symptoms.