Table 2. Activated clusters in each contrast

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | peak MNI coordinates | Cluster size | peak-p(FWER) |
|  |  | X | Y | Z | vertices | mm2 |
| Real code > Fake code |  |  |  |  |  |  |
| Left hemisphere |  |  |  |  |  |  |
| Lateral prefrontal cortex(inferior/middle frontal gyri, precentral and superior frontal sulci) | -51.7 | 16.8 | 21.1 | 1484 | 2962.45 | 0.0014 |
| Intra-parietal sulcus/supramarginal and angular gyri | -45.4 | -54.1 | 39.9 | 846 | 1206.53 | 0.0084 |
| Middle/inferior temporal gyri and superior temporal sulcus | -61.4 | -52.7 | -0.6 | 481 |  866.16 | 0.0128 |
| Calcarine sulcus/lingual gyrus | -5.3 | -75.4 | 0.1 | 342 |  773.52 | 0.0150 |
| Right hemisphere |  |  |  |  |  |  |
| Medial occipital cortexLingual gyrus/pericalcarine sulcus | 13.2 | -89.9 | -0.4 | 904 | 2313.45 | 0.0036 |
| Angular gyrus | 43.3 | -61.7 | 45.4 | 405 |  591.32 | 0.0356 |
| Inferior frontal sulcusPeak: middle frontal gyrus | 47.1 | 24.8 | 30.5 | 274 |  485.05 | 0.0448 |
| Language > Math |  |  |  |  |  |  |  |
| Left hemisphere |  |  |  |  |  |  |  |
| Superior temporal cortex | -51.6 | -7.7 | -14.0 | 2854 | 5384.96  | 0.0002 |
| Medial occipital cortexPeak: lingual gyrus | -7.4 | -93.7 | -8.7 | 1606 | 3693.39  | 0.0002 |
| Pars triangularis | -45.2 | 33.4 | -5.2 | 523 | 1070.54  | 0.0088 |
| Precuneus | -4.7 | -49.5 | 27.8 | 445 |  811.74  | 0.0172 |
| Superior frontal gyrus | -10.7 | 52.1 | 34.9 | 333 |  706.60  | 0.0224 |
| Right hemishpere |  |  |  |  |  |  |  |
| Occiptial pole | 12.8 | -92.0 | -7.1 | 932 | 2409.48  | 0.0006 |
| Anterior superior temporal sulcus | 57.6 | -8.4 | -7.3 | 446 | 1073.59  | 0.0104 |
| Temporal pole | 42.5 | 15.9 | -28.1 | 319 |  671.89  | 0.0222 |
| Posterior superior temporal sulcus | 51.5 | -34.1 | 4.1 | 298 |  613.10  | 0.027 |
| Medial orbitofrontal sulcus  | 8.5 | 46.7 | -13.7 | 199 |  547.23  | 0.0336 |
| Precuneus | 4.6 | -46.9 | 24.8 | 284 |  502.91  | 0.0376 |
| Math > Language |  |  |  |  |  |  |  |
| Left hemisphere |  |  |  |  |  |  |  |
| Intraparietal sulcusPeak: supramarginal gyrus | -50.4 | -38.9 | 44.0 | 1842 | 2797.80  | 0.0004 |
| Superior frontal sulcus | -27.2 | 3.5 | 49.7 | 437 |  827.32  | 0.015 |
| Anterior middle frontal gyrusPeak: inferior frontal sulcus | -34.8 | 37.0 | 9.9 | 375 |  702.91  | 0.0204 |
| Superior insula sulcus | -28.5 | 20.4 | 8.0 | 283 |  575.54  | 0.0308 |
| Inferior temporal gyrus | -53.2 | -59.3 | -9.3 | 291 |  484.12  | 0.0408 |
| Right hemisphere |  |  |  |  |  |  |  |
| Intraparietal sulcus | 31.1 | -46.8 | 43.2 | 2502 | 3491.09  | 0.0002 |
| Anterior middle frontal gyrus | 34.7 | 44.9 | 21.4 | 731 | 1406.92  | 0.0058 |
| Inferior temporal gyrus | 45.5 | -60.4 | -8.2 | 591 | 1176.76  | 0.0088 |
| Middle anterior cingulate cortex Peaks at the middle section of the pericallosal sulcus | 5.4 | -1.6 | 30.2 | 502 | 1040.37  | 0.0092 |
| Superior frontal gyrus | 21.1 | -4.0 | 59.1 | 504 |  934.90  | 0.011 |
| Anterior insula | 35.5 | 16.8 | -1.2 | 351 |  688.23  | 0.0218 |
| Inferior precentral sulcus | 48.4 | 5.8 | 27.7 | 257 |  549.18  | 0.0348 |
| Logic > Language |  |  |  |  |  |  |  |
| Left hemisphere |  |  |  |  |  |  |  |
| Intraparietal sulcus Extends medially to precuneus and ventrally to inferior temporal gyrus | -40.6 | -50.6 | 35.5 | 3347 | 5731.62 | 0.0004 |
| Pars orbitalis Extends dorsally to precentral and middle frontal gyri | -40.9 | 48.2 | -6.8 | 2120 | 4350.10 | 0.002 |
| Superior frontal gyrus | -9.3 | 33.4 | 37.2 | 310 | 700.63 | 0.0334 |
| Pericallosal sulcus | -7.4 | -32.0 | 30.0 | 333 | 640.21 | 0.0372 |
| Right hemisphere |  |  |  |  |  |  |  |
| Intraparietal sulcusExtends medially to precuneus and ventrally to inferior temporal gyrus | 31.0 | -47.0 | 40.2 | 3699 | 6446.9 | 0.0004 |
| Middle frontal gyrusExtends to superior frontal sulcus, precentral sulcus, and frontal pole | 45 | 34.5 | 26.1 | 1908 | 3816.88 | 0.0036 |
| Pericallosal sulcus | 8 | -36.3 | 29.1 | 343 | 683.83 | 0.0286 |
| MSIT |  |  |  |  |  |  |  |
| Left hemisphere |  |  |  |  |  |  |  |
| Fusiform gyrusExtends to intraparietal sulcus | -30.7 | -67.8 | -10.3 | 4059 | 7701.89 | 0.0002 |
| Superior precentral sulcus | -22.1 | -0.9 | 47.0 | 421 | 891.27 | 0.0232 |
| Superior insula sulcus | -33.8 | 23.1 | 11.1 | 339 | 690.26 | 0.0324 |
| Inferior precentral sulcus | -49 | -2.5 | 37.8 | 314 | 605.36 | 0.0406 |
| Right hemisphere |  |  |  |  |  |  |  |
| Intraparietal sulcusExtends to fusiform gyrus | 40.9 | -40.5 | 35.8 | 3727 | 6865.08 | 0.0002 |
| Superior insula sulcus | 29.7 | 26.8 | 4.3 | 438 | 838.39 | 0.0198 |
| Superior precentral sulcus | 29.6 | -13.0 | 52.1 | 391 | 748.22 | 0.0232 |
| Middle anterior cingulate cortexPeak at medial superior frontal gyrus | 10.5 | 12.0 | 47.7 | 313 | 598.73 | 0.0294 |
| Inferior precentral sulcus | 43.1 | 2.4 | 29.8 | 231 | 484.89 | 0.043 |

Table S3. FDR-corrected p-values for the post-hoc paired t-tests among the overlap between code contrast and the localizer contrasts

|  |  |  |  |
| --- | --- | --- | --- |
|  Contrasts (Left hemisphere) | Language > math | Math > language | Logic > language |
| Math > language | 0.607 | -- | -- |
| Logic > language | 0.033 | 0.037 | -- |
| MSIT | 0.624 | 0.210 | 0.001 |

|  |  |  |  |
| --- | --- | --- | --- |
| Contrasts (Right hemisphere) | Language > math | Math > language | Logic > language |
| Math > language | 0.895 | -- | -- |
| Logic > language | 0.103 | < 0.001 | -- |
| MSIT | 0.895 | 0.895 | 0.025 |