Table S1. Stereotactic coordinates of brain activation as revealed by contrast analyses

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Brain regions | L/R | BA | Cluster size | x | y | z | T-value |
| *(a) Forced-switch versus non-switch* | | | | | | | |
| Middle frontal gyrus /cingulate gyrus | L | 6/32 | 638 | -24 | 2 | 54 | 7.27 |
| Middle frontal gyrus | R | 6 | 496 | 28 | 2 | 56 | 6.04 |
| Middle frontal gyrus | L | 9 | 87 | -38 | 38 | 34 | 5.29 |
| Middle frontal gyrus | R | 10 | 108 | 36 | 46 | 30 | 5.20 |
| Inferior parietal lobule | L | 40 | 692 | -38 | -42 | 44 | 5.85 |
| Inferior parietal lobule | R | 40 | 122 | 60 | -48 | 44 | 5.08 |
| Caudate tail | R | - | 92 | 16 | -26 | 18 | 5.38 |
| Caudate tail | L | - | 36 | -16 | -32 | 12 | 4.86 |
|  |  |  |  |  |  |  |  |
| *(b) Free-naming versus non-switch* | | | | | | | |
| Superior/middle frontal gyrus | R | 6/8/9  /10/32 | 5894 | 18 | 12 | 62 | 9.67 |
| Superior/middle frontal gyrus | L | 6/8 | 843 | -26 | 2 | 58 | 9.20 |
| Superior/middle frontal gyrus | L | 9/10 | 1239 | -36 | 52 | 16 | 8.34 |
| Inferior frontal gyrus /insula | R | 47/13 | 196 | 34 | 22 | 2 | 6.48 |
| Middle frontal gyrus | L | 10 | 86 | -34 | 54 | -10 |  |
| Superior/inferior parietal lobule | R | 7/40 | 3182 | 38 | -42 | 42 | 8.38 |
| Superior/inferior parietal lobule | L | 7/40 | 1216 | -46 | -44 | 50 | 7.60 |
| Caudate tail/thalamus | R | - | 574 | 18 | -34 | 16 | 8.33 |
| Caudate tail/thalamus | L | - | 507 | -28 | -46 | 2 | 6.89 |
|  |  |  |  |  |  |  |  |
| *(c) Free language selection versus forced language selection* | | | | | | | |
| Middle frontal gyrus | L | 10 | 484 | -34 | 74 | -8 | 6.51 |
| Medial frontal gyrus | L | 9 | 317 | -4 | 48 | 28 | 6.30 |
| Middle frontal gyrus | R | 10 | 414 | 18 | 60 | 10 | 6.21 |
| Middle frontal gyrus | R | 8/9 | 293 | 30 | 14 | 62 | 6.12 |
| Superior temporal gyrus | L | 42 | 73 | -24 | 6 | -52 | 5.72 |
| Insula | R | 13 | 116 | 44 | -36 | 42 | 5.37 |

Note: Anatomical localization of brain activation areas (FDR-corrected, *p* < 0.001, k =30) as revealed by contrast analysis. The forced language selection context was established by the contrast analysis between forced-switch and non-switch condition. The free language selection context was established by the contrast analysis between free-naming and non-switch condition.

Table S2 Stereotactic coordinates of brain activation patterns for the meaning switching effect

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Brain regions | L/R | BA | Cluster size | x | y | z | T-value |
| Middle occipital gyrus | L/R | 18/19 | 24555 | -16 | -92 | -6 | 11.86 |
| /fusiform gyrus  /superior parietal lobule |  | /37  /7 |  |  |  |  |  |
| Middle frontal gyrus | L | 6/9 | 3503 | -46 | 0 | 58 | 6.76 |
| Superior frontal gyrus (SMA) | R | 6 | 781 | 16 | -4 | 76 | 7.13 |
| Caudate tail | R | - | 190 | 30 | -42 | 6 | 4.80 |
| Caudate tail | L | - | 61 | -20 | -34 | 14 | 4.39 |

Note: Anatomical localization of brain activated areas (FDR-corrected, *p* < 0.001, k =30) as revealed in the contrast analysis of the picture-switch versus picture-repeat condition.

Table S3 Stereotactic coordinates of brain activations as revealed by the conjunction analyses between (a) free-switching and forced-switching and (b) the forced-switch and non-switch condition

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Brain regions | L/R | BA | Cluster size | x | y | z | T-value |
| *(a) Conjunction analysis of free-switching and forced-switching* | | | | | | | |
| Middle frontal gyrus  /cingulate gyrus | L | 6/32 | 1388 | -24 | 2 | 54 | 7.27 |
| Middle frontal gyrus  /cingulate gyrus | R | 6/32 | 1625 | 28 | 2 | 56 | 6.04 |
| Middle frontal gyrus | L | 9/10 | 552 | -38 | 38 | 34 | 5.29 |
| Middle frontal gyrus | R | 9/10 | 673 | 36 | 46 | 30 | 5.20 |
| Inferior frontal gyrus | R | 44 | 247 | 58 | 14 | 4 | 5.07 |
| Superior/inferior parietal lobule | L | 7/40 | 2035 | 60 | -48 | 44 | 5.08 |
| Superior/inferior parietal lobule | R | 7/40 | 2300 | -38 | -42 | 44 | 5.58 |
| Caudate tail/thalamus | L | - | 466 | -16 | -32 | 12 | 5.07 |
| Caudate tail/thalamus | R | - | 441 | 28 | -44 | 8 | 5.47 |
|  |  |  |  |  |  |  |  |
| *(b) Conjunction of the forced-switch and non-switch condition* | | | | | | | |
| Inferior/middle frontal gyrus | L | 11/47 | 155 | -36 | 32 | -12 | 6.28 |
| Inferior/middle frontal gyrus | L | 11/47 | 155 | -36 | 32 | -12 | 6.28 |
| Medial frontal gyrus | L | 9 | 69 | -8 | 46 | 20 | 4.99 |
| Medial frontal gyrus | L/R | 11 | 61 | 0 | 38 | -14 | 4.86 |
| Anterior cingulate | L | 32 | 261 | -2 | 32 | 4 | 5.74 |
| Posterior cingulate | L | 31 | 147 | -8 | -60 | 20 | 4.66 |
| Postcentral | L | 3 | 270 | -48 | -24 | 62 | 6.27 |
| Middle occipital gyrus | L | 19 | 272 | -44 | -86 | 18 | 5.59 |
| Middle occipital gyrus | R | 19/37 | 918 | 48 | -82 | 16 | 7.46 |

Note: Anatomical localization of brain activations (*p*uncorr < 0.001). The free-switching is established by the contrast analysis between the free-naming condition and non-switch condition. The forced-switching is established by the contrast between the forced-switch and non-switch condition.

Table S4. Stereotactic coordinates of brain activations associated with naming volition as revealed by contrasting free language selection with forced language selection contexts.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Brain regions | L/R | BA | Cluster size | x | y | z | T-value |
| Medial frontal gyrus/ supplementary motor area | L/R | 8/6 | 448 | 0 | 22 | 48 | 7.86 |
| Middle frontal gyrus | R | 10/46 | 614 | 28 | 58 | 24 | 7.74 |
| Middle frontal gyrus | R | 9 | 117 | 38 | 40 | 40 | 7.23 |
| Middle frontal gyrus | L | 10 | 192 | -34 | 54 | 12 | 6.52 |
| Superior frontal gyrus | R | 6 | 541 | 16 | 30 | 56 | 7.19 |
| Superior frontal gyrus | L | 6 | 162 | -24 | 4 | 60 | 7.29 |
| Inferior parietal lobule | R | 40 | 809 | 50 | -36 | 48 | 7.22 |
| Middle temporal gyrus | R | 21 | 115 | 62 | -38 | -18 | 7.57 |
| Caudate/thalamus | R | - | 525 | 18 | -32 | 20 | 9.46 |
| Caudate | L | - | 292 | -22 | -42 | 10 | 7.84 |
| Caudate | L | - | 100 | -14 | -22 | 20 | 7.01 |

Note: Anatomical localization of brain activated areas (FDR-corrected, *p* < 0.001, k =30). The free language selection context is established by the free-naming condition and the forced language selection context is established by the conjunction analysis outcome of forced-switch and non-switch condition.