

|              | TDC | ADHD Combined | ADHD Inattentive | <i>total</i> |
|--------------|-----|---------------|------------------|--------------|
| KKI          | 34  | 7             | 4                | 45           |
| NeuroIMAGE   | 11  | 14            | 1                | 26           |
| NYU          | 46  | 59            | 29               | 134          |
| OHSU         | 18  | 19            | 6                | 43           |
| Peking_1     | 17  | 7             | 10               | 34           |
| Peking_2     | 31  | 15            | 20               | 66           |
| Peking_3     | 23  | 7             | 12               | 42           |
| Pittsburgh   | 46  | 0             | 0                | 46           |
| <i>total</i> | 226 | 128           | 82               | 436          |

Table S1 - Summary of the ADHD and TDC subjects used in this study.

Abbreviations are as follows: **TDC**, typically developing children; **KKI**, the Kennedy Krieger Institute; **NeuroIMAGE**, the NeuroIMAGE sample; **NYU**, the New York University Child Study Center; **OHSU**, Oregon Health and Science University; **Peking\_1**, **Peking\_2**, and **Peking\_3**, Peking University; and **Pittsburgh**, the University of Pittsburgh.

|              | TDC         | ADHD Combined | ADHD Inattentive | <i>total</i> |
|--------------|-------------|---------------|------------------|--------------|
| KKI          | 10.32 ±1.37 | 9.9 ±1.52     | 11.46 ±1.19      | 10.36 ±1.4   |
| NeuroIMAGE   | 17.38 ±2.27 | 17.04 ±2.19   | 18.8 ±0          | 17.25 ±2.16  |
| NYU          | 12.21 ±3.16 | 10.93 ±2.58   | 12.48 ±2.78      | 11.71 ±2.89  |
| OHSU         | 8.94 ±1.43  | 8.76 ±1.09    | 8.9 ±1.31        | 8.85 ±1.24   |
| Peking_1     | 11.8 ±1.32  | 10.7 ±1.15    | 11.88 ±2.82      | 11.6 ±1.86   |
| Peking_2     | 11.66 ±1.81 | 12.08 ±2.07   | 12.95 ±1.44      | 12.15 ±1.83  |
| Peking_3     | 13.21 ±0.95 | 12.33 ±1.06   | 13.84 ±1.21      | 13.24 ±1.14  |
| Pittsburgh   | 14.57 ±2.87 | N/A           | N/A              | 14.57 ±2.87  |
| <i>total</i> | 12.39 ±2.99 | 11.42 ±3.05   | 12.49 ±2.5       | 12.12 ±2.95  |

Table S2 - The age distribution of subjects used in this study.  
*TDC, typically developing children.*

| series | dataset    | subject   | age   | dx | series | dataset | subject | age   | dx | series | dataset  | subject | age   | dx | series | dataset    | subject | age   | dx |
|--------|------------|-----------|-------|----|--------|---------|---------|-------|----|--------|----------|---------|-------|----|--------|------------|---------|-------|----|
| 1      | KKI        | 1019436   | 12.98 | 3  | 110    | NYU     | 10069   | 16.93 | 0  | 219    | OHSU     | 2232413 | 9.17  | 0  | 328    | Peking_2   | 3856956 | 13.75 | 3  |
| 2      | KKI        | 1043241   | 9.12  | 0  | 111    | NYU     | 10070   | 10.52 | 0  | 220    | OHSU     | 2288903 | 7.42  | 1  | 329    | Peking_2   | 3910672 | 10.08 | 1  |
| 3      | KKI        | 1535233   | 9.64  | 0  | 112    | NYU     | 10071   | 14.09 | 3  | 221    | OHSU     | 2292940 | 8     | 1  | 330    | Peking_2   | 3993793 | 10.33 | 0  |
| 4      | KKI        | 1577042   | 9.06  | 1  | 113    | NYU     | 10072   | 7.25  | 1  | 222    | OHSU     | 2409220 | 7.67  | 0  | 331    | Peking_2   | 3994098 | 12.75 | 0  |
| 5      | KKI        | 1594156   | 12.87 | 0  | 114    | NYU     | 10073   | 14.46 | 1  | 223    | OHSU     | 2415970 | 8.58  | 3  | 332    | Peking_2   | 4053388 | 11.08 | 1  |
| 6      | KKI        | 1686265   | 8.02  | 0  | 115    | NYU     | 10074   | 8.06  | 1  | 224    | OHSU     | 2455205 | 7.5   | 1  | 333    | Peking_2   | 4055710 | 13.33 | 3  |
| 7      | KKI        | 1779922   | 10.84 | 0  | 116    | NYU     | 10075   | 11.09 | 3  | 225    | OHSU     | 2535204 | 8.42  | 1  | 334    | Peking_2   | 4073815 | 9.83  | 3  |
| 8      | KKI        | 1842819   | 10.09 | 0  | 117    | NYU     | 10078   | 8.19  | 1  | 226    | OHSU     | 2559559 | 7.92  | 3  | 335    | Peking_2   | 4075719 | 13.08 | 1  |
| 9      | KKI        | 1988015   | 11.17 | 0  | 118    | NYU     | 10079   | 15.27 | 0  | 227    | OHSU     | 2561174 | 8.67  | 1  | 336    | Peking_2   | 4221029 | 9.67  | 1  |
| 10     | KKI        | 1996183   | 11.04 | 3  | 119    | NYU     | 10082   | 11.4  | 0  | 228    | OHSU     | 2571197 | 7.67  | 1  | 337    | Peking_2   | 4225073 | 10.33 | 3  |
| 11     | KKI        | 2014113   | 10.35 | 1  | 120    | NYU     | 10086   | 15.83 | 1  | 229    | OHSU     | 2620872 | 8.92  | 1  | 338    | Peking_2   | 4265987 | 10.08 | 0  |
| 12     | KKI        | 2018106   | 11.66 | 0  | 121    | NYU     | 10087   | 17.61 | 3  | 230    | OHSU     | 2920716 | 7.5   | 0  | 339    | Peking_2   | 5993008 | 12.25 | 3  |
| 13     | KKI        | 2104012   | 9.62  | 0  | 122    | NYU     | 10088   | 14.66 | 0  | 231    | OHSU     | 2947936 | 8.5   | 0  | 340    | Peking_2   | 6500128 | 11.33 | 3  |
| 14     | KKI        | 2299519   | 11.89 | 1  | 123    | NYU     | 10090   | 16.32 | 1  | 232    | OHSU     | 3051944 | 11.75 | 0  | 341    | Peking_2   | 7011503 | 13.33 | 0  |
| 15     | KKI        | 2360428   | 8.56  | 0  | 124    | NYU     | 10091   | 8.93  | 1  | 233    | OHSU     | 3052540 | 9.17  | 1  | 342    | Peking_2   | 7253183 | 13.17 | 3  |
| 16     | KKI        | 2554127   | 9.02  | 0  | 125    | NYU     | 10092   | 17.3  | 0  | 234    | OHSU     | 3162671 | 8.5   | 0  | 343    | Peking_2   | 7407032 | 13.42 | 0  |
| 17     | KKI        | 2558999   | 8.87  | 0  | 126    | NYU     | 10095   | 14.39 | 1  | 235    | OHSU     | 3244985 | 7.17  | 0  | 344    | Peking_2   | 7689953 | 13.5  | 3  |
| 18     | KKI        | 2572285   | 8.33  | 0  | 127    | NYU     | 10096   | 14.94 | 3  | 236    | OHSU     | 3302025 | 9     | 0  | 345    | Peking_2   | 8278680 | 13.25 | 3  |
| 19     | KKI        | 2601925   | 9.58  | 0  | 128    | NYU     | 10100   | 16.88 | 0  | 237    | OHSU     | 3466651 | 8.08  | 1  | 346    | Peking_2   | 9002207 | 11.17 | 1  |
| 20     | KKI        | 2618929   | 10.09 | 0  | 129    | NYU     | 10101   | 14.2  | 1  | 238    | OHSU     | 3470141 | 8.5   | 1  | 347    | Peking_2   | 9578631 | 14.33 | 0  |
| 21     | KKI        | 2640795   | 12.47 | 0  | 130    | NYU     | 10102   | 16.55 | 0  | 239    | OHSU     | 3652932 | 7.67  | 3  | 348    | Peking_2   | 9640133 | 13.75 | 0  |
| 22     | KKI        | 2703289   | 11.1  | 0  | 131    | NYU     | 10103   | 9.59  | 1  | 240    | OHSU     | 3677724 | 8.75  | 3  | 349    | Peking_3   | 1050345 | 12.67 | 0  |
| 23     | KKI        | 2740232   | 11.09 | 0  | 132    | NYU     | 10104   | 13.35 | 3  | 241    | OHSU     | 3869075 | 8.67  | 0  | 350    | Peking_3   | 1132854 | 13.92 | 0  |
| 24     | KKI        | 2917777   | 12.66 | 0  | 133    | NYU     | 10106   | 11.82 | 3  | 242    | OHSU     | 4016887 | 9.08  | 1  | 351    | Peking_3   | 1356553 | 11.75 | 1  |
| 25     | KKI        | 2930625   | 9.97  | 0  | 134    | NYU     | 10107   | 17.37 | 3  | 243    | OHSU     | 5302451 | 11.33 | 3  | 352    | Peking_3   | 1399863 | 12.83 | 1  |
| 26     | KKI        | 3103809   | 9.3   | 0  | 135    | NYU     | 10111   | 7.74  | 0  | 244    | OHSU     | 6592761 | 7.58  | 0  | 353    | Peking_3   | 1404738 | 12.58 | 0  |
| 27     | KKI        | 3119327   | 10.15 | 3  | 136    | NYU     | 10112   | 14.79 | 0  | 245    | OHSU     | 6953386 | 11.83 | 1  | 354    | Peking_3   | 1411536 | 13.17 | 0  |
| 28     | KKI        | 3154996   | 11.65 | 3  | 137    | NYU     | 10114   | 16.73 | 0  | 246    | OHSU     | 7333005 | 9     | 1  | 355    | Peking_3   | 1662160 | 12.58 | 0  |
| 29     | KKI        | 3160561   | 11.95 | 1  | 138    | NYU     | 10115   | 15.32 | 3  | 247    | OHSU     | 8218392 | 8.33  | 0  | 356    | Peking_3   | 1771270 | 14.42 | 3  |
| 30     | KKI        | 3611827   | 9.08  | 1  | 139    | NYU     | 10116   | 16.77 | 3  | 248    | OHSU     | 9499804 | 8.17  | 0  | 357    | Peking_3   | 1794770 | 11.75 | 0  |
| 31     | KKI        | 3699991   | 12.77 | 0  | 140    | NYU     | 10117   | 9.35  | 0  | 249    | Peking_1 | 1056121 | 13.92 | 0  | 358    | Peking_3   | 1843546 | 14.08 | 3  |
| 32     | KKI        | 3884955   | 11.84 | 0  | 141    | NYU     | 10118   | 13.33 | 1  | 250    | Peking_1 | 1133221 | 12.33 | 1  | 359    | Peking_3   | 2107404 | 13.08 | 0  |
| 33     | KKI        | 3902469   | 10.64 | 0  | 142    | NYU     | 10119   | 7.77  | 3  | 251    | Peking_1 | 1186237 | 13.92 | 3  | 360    | Peking_3   | 2208591 | 12.5  | 0  |
| 34     | KKI        | 3917422   | 8.19  | 1  | 143    | NYU     | 10122   | 16.28 | 0  | 252    | Peking_1 | 1240299 | 9.5   | 1  | 361    | Peking_3   | 2228148 | 13.75 | 1  |
| 35     | KKI        | 3972956   | 10.12 | 0  | 144    | NYU     | 10123   | 16.13 | 0  | 253    | Peking_1 | 1282248 | 10.58 | 3  | 362    | Peking_3   | 2268253 | 14.83 | 0  |
| 36     | KKI        | 4104523   | 12.43 | 0  | 145    | NYU     | 10125   | 7.19  | 0  | 254    | Peking_1 | 1408093 | 11.92 | 0  | 363    | Peking_3   | 2276801 | 13    | 3  |
| 37     | KKI        | 5216908   | 10.82 | 0  | 146    | NYU     | 10126   | 9.7   | 1  | 255    | Peking_1 | 1879542 | 13.58 | 0  | 364    | Peking_3   | 2493190 | 13.33 | 0  |
| 38     | KKI        | 6346605   | 10.69 | 0  | 147    | NYU     | 10128   | 9.53  | 0  | 256    | Peking_1 | 1947991 | 9.42  | 3  | 365    | Peking_3   | 2524687 | 14.33 | 3  |
| 39     | KKI        | 7129258   | 9.73  | 0  | 148    | NYU     | 1000804 | 7.29  | 0  | 257    | Peking_1 | 2174595 | 9.83  | 1  | 366    | Peking_3   | 2780647 | 13.58 | 1  |
| 40     | KKI        | 7415617   | 10.9  | 0  | 149    | NYU     | 1023964 | 8.29  | 3  | 258    | Peking_1 | 2196753 | 10.33 | 3  | 367    | Peking_3   | 2907951 | 16    | 3  |
| 41     | KKI        | 8083695   | 8.62  | 0  | 150    | NYU     | 1057962 | 8.78  | 1  | 259    | Peking_1 | 2266806 | 11.25 | 0  | 368    | Peking_3   | 2940712 | 13.08 | 3  |
| 42     | KKI        | 8263351   | 8.34  | 0  | 151    | NYU     | 1187766 | 12.79 | 1  | 260    | Peking_1 | 2367157 | 12.08 | 1  | 369    | Peking_3   | 2984158 | 14.17 | 3  |
| 43     | KKI        | 8337695   | 8.8   | 1  | 152    | NYU     | 1283494 | 8.61  | 1  | 261    | Peking_1 | 2535087 | 13.33 | 0  | 370    | Peking_3   | 3224401 | 12.92 | 0  |
| 44     | KKI        | 8658218   | 9.75  | 0  | 153    | NYU     | 1320247 | 8.59  | 0  | 262    | Peking_1 | 2833684 | 10.42 | 0  | 371    | Peking_3   | 3277313 | 12.33 | 0  |
| 45     | KKI        | 9922944   | 10.3  | 0  | 154    | NYU     | 1359325 | 10.76 | 0  | 263    | Peking_1 | 2910270 | 13.83 | 3  | 372    | Peking_3   | 3291029 | 14.83 | 3  |
| 46     | NeuroIMAGE | 1125505   | 19.3  | 0  | 155    | NYU     | 1435954 | 11.92 | 0  | 264    | Peking_1 | 3004580 | 14    | 0  | 373    | Peking_3   | 3385520 | 13.5  | 0  |
| 47     | NeuroIMAGE | 1312097   | 15.41 | 0  | 156    | NYU     | 1471736 | 13.32 | 3  | 265    | Peking_1 | 3086074 | 11.5  | 0  | 374    | Peking_3   | 3473830 | 12.67 | 0  |
| 48     | NeuroIMAGE | 1585708   | 15.96 | 1  | 157    | NYU     | 1497055 | 8.56  | 1  | 266    | Peking_1 | 3212536 | 12.17 | 0  | 375    | Peking_3   | 3624598 | 14.58 | 0  |
| 49     | NeuroIMAGE | 2029723   | 16.5  | 1  | 158    | NYU     | 1511464 | 10.12 | 3  | 267    | Peking_1 | 3269608 | 12.08 | 0  | 376    | Peking_3   | 3672300 | 14    | 3  |
| 50     | NeuroIMAGE | 2352986   | 20.47 | 0  | 159    | NYU     | 1517240 | 10.06 | 1  | 268    | Peking_1 | 3390312 | 10.33 | 3  | 377    | Peking_3   | 3712305 | 11    | 3  |
| 51     | NeuroIMAGE | 2671604   | 17.46 | 0  | 160    | NYU     | 1737393 | 11.24 | 0  | 269    | Peking_1 | 3593327 | 10    | 0  | 378    | Peking_3   | 3803759 | 13.17 | 3  |
| 52     | NeuroIMAGE | 2961243   | 16.51 | 1  | 161    | NYU     | 1780174 | 11.18 | 1  | 270    | Peking_1 | 3707771 | 10.42 | 0  | 379    | Peking_3   | 3870624 | 11    | 1  |
| 53     | NeuroIMAGE | 3007585   | 19.05 | 0  | 162    | NYU     | 1884448 | 8.91  | 0  | 271    | Peking_1 | 3889095 | 11.92 | 0  | 380    | Peking_3   | 3930512 | 12.58 | 0  |
| 54     | NeuroIMAGE | 3048588   | 13.92 | 1  | 163    | NYU     | 1918630 | 7.55  | 1  | 272    | Peking_1 | 3976121 | 11    | 1  | 381    | Peking_3   | 4006710 | 14    | 3  |
| 55     | NeuroIMAGE | 3082137   | 17.93 | 1  | 164    | NYU     | 1992284 | 7.26  | 1  | 273    | Peking_1 | 3983607 | 9.67  | 1  | 382    | Peking_3   | 4048810 | 14.67 | 0  |
| 56     | NeuroIMAGE | 3108222   | 13.33 | 1  | 165    | NYU     | 1995121 | 11.43 | 0  | 274    | Peking_1 | 4028266 | 9.25  | 3  | 383    | Peking_3   | 4136226 | 11.25 | 0  |
| 57     | NeuroIMAGE | 3304956   | 15.78 | 0  | 166    | NYU     | 2030383 | 13.56 | 1  | 275    | Peking_1 | 4095748 | 10.5  | 1  | 384    | Peking_3   | 4241194 | 11.67 | 1  |
| 58     | NeuroIMAGE | 3322144   | 17.5  | 1  | 167    | NYU     | 2054438 | 8.11  | 1  | 276    | Peking_1 | 4334113 | 14.58 | 3  | 385    | Peking_3   | 5575344 | 13.75 | 0  |
| 59     | NeuroIMAGE | 3449233   | 20.15 | 1  | 168    | NYU     | 2107638 | 10.41 | 1  | 277    | Peking_1 | 4921428 | 9.58  | 0  | 386    | Peking_3   | 5669389 | 13.75 | 0  |
| 60     | NeuroIMAGE | 3515506   | 18.8  | 3  | 169    | NYU     | 2136051 | 9.23  | 0  | 278    | Peking_1 | 7093319 | 11.42 | 0  | 387    | Peking_3   | 6383713 | 11.75 | 1  |
| 61     | NeuroIMAGE | 3566449   | 17.78 | 1  | 170    | NYU     | 2230510 | 9.17  | 1  | 279    | Peking_1 | 7390867 | 17.33 | 3  | 388    | Peking_3   | 6477085 | 13    | 0  |
| 62     | NeuroIMAGE | 3808273   | 14.25 | 1  | 171    | NYU     | 2260910 | 12.07 | 1  | 280    | Peking_1 | 9210521 | 9.25  | 3  | 389    | Peking_3   | 7994085 | 14.92 | 0  |
| 63     | NeuroIMAGE | 3858891   | 18.32 | 0  | 172    | NYU     | 2297413 | 11.06 | 3  | 281    | Peking_1 | 9221927 | 11.83 | 0  | 390    | Peking_3   | 8191384 | 13.42 | 0  |
| 64     | NeuroIMAGE | 3888614   | 16.8  | 1  | 173    | NYU     | 2306976 | 11.53 | 1  | 282    | Peking_1 | 9887336 | 11.33 | 0  | 391    | Pittsburgh | 16001   | 10.11 | 0  |
| 65     | NeuroIMAGE | 3941358   | 18.8  | 1  | 174    | NYU     | 2497695 | 11.61 | 1  | 283    | Peking_2 | 1050975 | 13.58 | 0  | 392    | Pittsburgh | 16003   | 10.46 | 0  |
| 66     | NeuroIMAGE | 3980079   | 19.15 | 1  | 175    | NYU     | 2570769 | 13.49 | 1  | 284    | Peking_2 | 1068505 | 10.25 | 0  | 393    | Pittsburgh | 16004   | 10.49 | 0  |
| 67     | NeuroIMAGE | 4134561   | 15.55 | 0  | 176    | NYU     | 2682736 | 10.78 | 1  | 285    | Peking_2 | 1093743 | 11.92 | 0  | 394    | Pittsburgh | 16006   | 10.76 | 0  |
| 68     | NeuroIMAGE | 4239636   | 20.54 | 1  | 177    | NYU     | 2735617 | 11.42 | 0  | 286    | Peking_2 | 1094669 | 12.42 | 1  | 395    | Pittsburgh | 16008   | 11.03 | 0  |
| 69     | NeuroIMAGE | 4285031   | 12.84 | 0  | 178    | NYU     | 2741068 | 8.53  | 1  | 287    | Peking_2 | 1117299 | 13.5  | 0  | 396    | Pittsburgh | 16009   | 11.12 | 0  |
| 70     | NeuroIMAGE | 6115230   | 19.39 | 0  | 179    | NYU     | 2821683 | 10.69 | 3  | 288    | Peking_2 | 1159908 | 15.08 | 1  | 397    | Pittsburgh | 16010   | 11.24 | 0  |
| 71     | NeuroIMAGE | 8409791</ |       |    |        |         |         |       |    |        |          |         |       |    |        |            |         |       |    |

(a) McNemar's test of 1NN models based on LBP-TOP features

| parcellations | radius    | DOF9          | DOF12         | ART           |
|---------------|-----------|---------------|---------------|---------------|
| brain mask    | R1 and R3 | 0.4403        | 0.9247        | 0.2699        |
|               | R2 and R3 | <u>1.0000</u> | 1.0000        | <u>0.4606</u> |
|               | R1 and R2 | 0.2891        | 1.0000        | 0.0602        |
| AAL           | R1 and R3 | <u>0.7664</u> | <u>0.4966</u> | <u>0.9331</u> |
|               | R2 and R3 | 0.7794        | <u>0.2225</u> | 1.0000        |
|               | R1 and R2 | <u>0.4941</u> | 1.0000        | <u>0.8557</u> |
| CC200         | R1 and R3 | 0.6935        | <u>0.3583</u> | <u>0.1883</u> |
|               | R2 and R3 | 1.0000        | <u>0.3914</u> | <u>0.1359</u> |
|               | R1 and R2 | 0.7373        | <u>0.8041</u> | <u>0.9247</u> |

(b) McNemar's test of linear-SVM models based on LBP-TOP features

| parcellations | radius    | DOF9          | DOF12         | ART           |
|---------------|-----------|---------------|---------------|---------------|
| brain mask    | R1 and R3 | 0.7237        | 1.0000        | 0.8423        |
|               | R2 and R3 | <u>0.6511</u> | <u>0.7277</u> | <u>0.8150</u> |
|               | R1 and R2 | 0.3816        | 0.7119        | 0.5940        |
| AAL           | R1 and R3 | 0.8897        | 0.3222        | 1.0000        |
|               | R2 and R3 | 0.0425        | 0.3613        | 0.0485        |
|               | R1 and R2 | <u>0.1531</u> | 0.8711        | <u>0.1366</u> |
| CC200         | R1 and R3 | 0.4962        | 0.7874        | <b>0.0272</b> |
|               | R2 and R3 | 0.1237        | 0.7194        | 0.2812        |
|               | R1 and R2 | <u>0.7423</u> | 1.0000        | 0.1182        |

Table S4 – p-values of McNemar's test of 1NN models and linear-SVM models based on LBP-TOP features between different radii (R1, R2, R3).

The p-values without under lines denote the accuracies of R3 are bigger than R2, the accuracies of R3 are bigger than R1, and the accuracies of R2 are bigger than R2. The underlined p-values show the inverse relationship. Bold p-values correspond to significant results (p-value < 0.05). **DOF9**, and **DOF12**, linear registration with 9, and 12 degree of freedom, respectively; **ART**, non-linear registration performed by Automated Registration Tool; **AAL**, automated anatomical labeling template; and **CC200**, spatially constrained parcellation based on rs-fMRI.

(a) McNemar's test of 1NN models based on LBP-TOP features

| parcellations | radius | DOF9 and ART  | DOF12 and ART | DOF9 and DOF12 |
|---------------|--------|---------------|---------------|----------------|
| brain mask    | R1     | 1.0000        | <u>0.2415</u> | 0.1297         |
|               | R2     | 0.3309        | 0.6508        | 0.6060         |
|               | R3     | 0.7139        | <u>0.8533</u> | 0.4606         |
| AAL           | R1     | 0.1268        | 0.1479        | 1.0000         |
|               | R2     | 0.0564        | 0.2392        | 0.2976         |
|               | R3     | 0.0760        | <b>0.0373</b> | <u>0.8097</u>  |
| CC200         | R1     | <b>0.0245</b> | 0.2176        | 0.1715         |
|               | R2     | <b>0.0437</b> | 0.1254        | 0.5186         |
|               | R3     | 0.5329        | 0.3951        | <u>0.8918</u>  |

(b) McNemar's test of linear-SVM models based on LBP-TOP features

| parcellations | radius | DOF9 and ART  | DOF12 and ART | DOF9 and DOF12 |
|---------------|--------|---------------|---------------|----------------|
| brain mask    | R1     | 0.7806        | 0.6272        | <u>0.9049</u>  |
|               | R2     | 0.9187        | 0.5006        | <u>0.4795</u>  |
|               | R3     | 0.8220        | 0.4220        | <u>0.5827</u>  |
| AAL           | R1     | 0.2460        | 0.1936        | <u>1.0000</u>  |
|               | R2     | 0.2891        | <u>1.0000</u> | 0.1198         |
|               | R3     | 0.2837        | 0.5713        | 0.5108         |
| CC200         | R1     | <u>0.4068</u> | <u>0.2945</u> | 0.8828         |
|               | R2     | 0.4825        | 0.9035        | 0.4414         |
|               | R3     | 0.6301        | 0.5383        | <u>1.0000</u>  |

Table S5 – *p*-values of McNemar's test of 1NN models and linear-SVM models based on LBP-TOP features between different registrations

The *p*-values without under lines denote the accuracies of ART are bigger than DOF9, the accuracies of ART are bigger than DOF12, and the accuracies of DOF12 are bigger than DOF9. The underlined *p*-values show the inverse relationship. Bold *p*-values correspond to significant results (*p*-value < 0.05). **DOF9**, and **DOF12**, linear registration with 9, and 12 degree of freedom, respectively; **ART**, non-linear registration performed by Automated Registration Tool; **AAL**, automated anatomical labeling template; and **CC200**, spatially constrained parcellation based on rs-fMRI.

| parcellations | radius | GM-CSF       | GM-WM        |
|---------------|--------|--------------|--------------|
| Brain         | R1     | <u>0.329</u> | 0.136        |
|               | R2     | <u>0.847</u> | 0.834        |
|               | R3     | <u>0.127</u> | <u>1.000</u> |
| AAL           | R1     | 1.000        | 0.464        |
|               | R2     | 0.909        | 1.000        |
|               | R3     | 0.740        | 0.248        |
| CC200         | R1     | <b>0.045</b> | 0.057        |
|               | R2     | 0.065        | 0.059        |
|               | R3     | 0.176        | 0.073        |

Table S6 – p-values of McNemar’s test of results in table 6.

The p-values without under lines denote the accuracies of GM are bigger than CSF and the accuracies of GM are bigger than WM. The underlined p-values show the inverse relationship. Bold p-values correspond to significant results (p-value < 0.05). **DOF9**, and **DOF12**, linear registration with 9, and 12 degree of freedom, respectively; **ART**, non-linear registration performed by Automated Registration Tool; **AAL**, automated anatomical labeling template; and **CC200**, spatially constrained parcellation based on rs-fMRI.