SUPPLEMENTARY MATERIALS

**Table S1.** Association analyses of MRI structural metrics with memory K scores for controls and PD patients .

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| **a-1. Controls (N=22)** |
| *Correlation coefficient R**(p-value)* |
|  Delayed Memory |  |  Working Memory |
|  | Low-Load | Low-Load with Distractor | High-Load | Memory Load 2 | Memory Load 3 | Memory Load 4 | Memory Load 5 | Memory Load 6 |
| L. inferior Frontal-Opercular | 0.372(0.107) | -0.017(0.944) | -0.062(0.794) | **0.481****(0.032)** | 0.208(0.380) | 0.314(0.178) | 0.022(0.928) | 0.067(0.780) |
| L. Inferior Frontal-Triangular | 0.222(0.348) | -0.177(0.456) | 0.122(0.607) | 0.440(0.052) | 0.362(0.117) | 0.365(0.114) | 0.025(0.916) | 0.123(0.606) |
| L. middle FrontalGyrus | 0.254(0.279) | -0.34(0.887) | 0.-99(0.679) | 0.076(0.752) | -0.084(0.725) | 0.052(0.828) | -0.099(0.677) | 0.190(0.423) |
| L. AngularGyrus | 0.190(0.422) | 0.068(0.776) | 0.258(0.271) | -0.072(0.762) | -0.049(0.838) | -0.013(0.955) | 0.110(0.644) | 0.306(0.190) |
| L. Supra-marginalgyrus | 0.149(0.531) | -0.094(0.693) | -0.011(0.964) | 0.064(0.790) | -0.119(0.618) | 0.025(0.918) | -0.094(0.693) | -0.079(0.740) |
| L. superiorTemporalgyrus | -0.144(0.546) | -0.299(0.201) | -0.311(0.181) | **-0.448****(0.048)** | -0.359(0.120) | -0.383(0.095) | -0.121(0.613) | -0.009(0.969) |
| L. superiorFrontalgyrus | **0.466****(0.038)** | 0.148(0.532) | 0.070(0.770) | 0.088(0.711) | 0.160(0.499) | 0.221(0.350) | 0.107(0.653) | **0.460****(0.041)** |
| L. superiorParietalGyrus | 0.292(0.212) | 0.098(0.680) | 0.020(0.935) | -0.071(0.765) | 0.021(0.930) | -0.008(0.975) | -0.223(0.346) | 0.050(0.835) |
| L. Intra-parietalSulcus | 0.346(0.135) | 0.133(0.577) | -0.052(0.829) | -0.214(0.364) | 0.004(0.988) | -0.022(0.926) | -0.1010.673) | 0.092(0.701) |
| L. EntorhinalCortex | -0.021(0.929) | 0.155(0.514) | 0.246(0.296) | 0.315(0.176) | 0.429(0.059) | 0.332(0.152) | 0.265(0.259) | 0.255(0.278) |
| L. Para-hippocampalGyrus | 0.027(0.911) | 0.034(0.887) | 0.057(0.810) | -0.045(0.851) | -0.138(0.561) | -0.181(0.44 | -0.253(0.283) | -0.351(0.129) |
| L. hippocampalvolume | 0.118(0.622) | 0.275(0.240) | 0.166(0.483) | 0.366(0.113) | 0.155(0.514) | 0.350(0.131) | 0.183(0.441) | 0.030(0.900) |
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| **a-2. Controls (N=22)** |
| *Correlation coefficient R**(p-value)* |
|  Delayed Memory |  |  Working Memory |
|  | Low-Load | Low-Load with Distractor | High-Load | Memory Load 2 | Memory Load 3 | Memory Load 4 | Memory Load 5 | Memory Load 6 |
| R. inferior Frontal-Opercular | 0.224(0.343) | 0.109(0.648) | 0.104(0.663) | 0.198(0.403) | -0.088(0.712) | 0.123(0.605) | -0.140(0.556) | -0.052(0.829) |
| R. Inferior Frontal-Triangular | 0.327(0.160) | 0.054(0.823) | -0.042(0.860) | -0.218(0.355) | -0.098(0.680) | -0.180(0.448) | -0.249(0.289) | -0.084(0.726) |
| R. middle FrontalGyrus | 0.397(0.083) | 0.239(0.311) | 0.242(0.303) | -0.045(0.850) | 0.054(0.820) | 0.191(0.421) | 0.085(0.722) | 0.256(0.277) |
| R. AngularGyrus | 0.084(0.725) | -0.041(0.864) | -0.028(0.906) | -0.116(0.627) | 0.048(0.840) | -0.070(0.770) | 0.092(0.701) | 0.190(0.422) |
| R. Supra-marginalgyrus | 0.319(0.171) | 0.101(0.672) | -0.117(0.623) | -0.232(0.325) | -0.075(0.755) | -0.264(0.261) | -0.320(0.169) | -0.105(0.659) |
| R. superiorTemporalgyrus | 0.281(0.231) | 0.051(0.831) | -0.005(0.982) | -0.235(0.319) | -0.3005(0.198) | -0.253(0.2883) | -0.328(0.158) | -0.155(0.515) |
| R. superiorFrontalgyrus | 0.324(0.164) | 0.108(0.649) | 0.034(0.886) | 0.007(0.975) | 0.121(0.613) | 0.109(0.648) | 0.235(0.318) | **0.512****(0.021)** |
| R. superiorParietalGyrus |  0.211 (0.371) | 0.096(0.688) | 0.115(0.628) | -0.161(0.498) | 0.102(0.669) | -0.080(0.738) | 0.037(0.876) | 0.276(0.239) |
| R. Intra-parietalSulcus | 0.151(0.525) | 0.024(0.920) | 0.010(0.965) | -0.232(0.326) | -0.055(0.818) | -0.129(0.587) | 0.087(0.717) | 0.232(0.325) |
| R. EntorhinalCortex | 0.260(0.268) | 0.058(0.809) | 0.320(0.170) | 0.249(0.290) | 0.098(0.683) | 0.261(0.266) | 0.006(0.982) | 0.238(0.313) |
| R. Para-hippocampalGyrus | 0.068(0.775) | 0.030(0.899) | 0.024(0.922) | -0.124(0.601) | -0.286(0.221) | -0.145(0.543) | -0.068(0.774) | -0.265(0.258) |
| R. hippocampalvolume | 0.061(0.798) | 0.144(0.544) | 0.061(0.798) | 0.279(0.234) | -0.020(0.934) | 0.255(0.277) | 0.114(0.632) | -0.063(0.792) |
|  |  |  |  |  |  |  |  |  |
| **b-1. PD Patients (N=19)** |
| *Correlation coefficient R**(p-value)* |
|  Delayed Memory | Working Memory |
|  | Low-Load | Low-Load with Distractor | High-Load | Memory Load 2 | Memory Load 3 | Memory Load 4 | Memory Load 5 | Memory Load 6 |
| L. inferior Frontal-Opercular | 0.237(0.360) | 0.330(0.196) | 0.255(0.322) | **0.640\*****(0.006)** | **0.546****(0.024)** | **0.505****(0.039)** | 0.293(0.254) | **0.487****(0.047)** |
| L. Inferior Frontal-Triangular | 0.206(0.427) | 0.195(0.453) | 0.019(0.941) | **0.582****(0.014)** | **0.489****(0.046)** | 0.429(0.086) | 0.173(0.506) | 0.212(0.414) |
| L. middle FrontalGyrus | -0.219(0.398) | -0.259(0.315) | 0.133(0.610) | 0.125(0.634) | 0.170(0.513) | 0.162(0.534) | -0.050(0.848) | 0.475(0.054) |
| L. AngularGyrus | 0.046(0.861) | 0.161(0.538) | 0.258(0.318) | 0.215(0.408) | 0.284(0.269) | 0.023(0.930) | -0.025(0.923) | 0.256(0.322) |
| L. Supra-marginalgyrus | 0.263(0.309) | 0.232(0.370) | 0.414(0.099) | 0.466(0.060) | 0.431(0.084) | 0.208(0.423) | 0.162(0.535) | **0.679\*****(0.003)** |
| L. superiorTemporalGyrus | **0.493****(0.044)** | **0.563****(0.019)** | 0.359(0.157) | **0.604\*****(0.010)** | **0.575****(0.016)** | **0.714\*****(0.001)** | **0.594****(0.012)** | **0.595****(0.012)** |
| L. superiorFrontalgyrus | -0.112(0.668) | -0.215(0.407) | 0.115(0.660) | 0.134(0.607) | 0.203(0.434) | 0.010(0.969) | -0.086(0.744) | -0.093(0.724) |
| L. superiorParietalGyrus | 0.188(0.469) | 0.037(0.887) | 0.165(0.526) | 0.417(0.096) | 0.464(0.061) | 0.271(0.293) | 0.307(0.231) | 0.355(0.162) |
| L. Intra-parietalSulcus | 0.359(0.157) | 0.139(0.596) | 0.315(0.219) | 0.325(0.203) | **0.568****(0.017)** | 0.211(0.417) | 0.282(0.274) | 0.346(0.174) |
| L. EntorhinalCortex | 0.012(0.965) | 0.156(0.550) | -0.215(0.408) | 0.065(0.804) | -0.197(0.448) | -0.062(0.812) | -0.038(0.885) | -0.170(0.515) |
| L. Para-hippocampalGyrus | 0.156(0.549) | 0.168(0.520) | 0.363(0.152) | -0.107(0.683) | 0.217(0.403) | 0.014(0.958) | -0.112(0.669) | 0.391(0.121) |
| L. hippocampalvolume | -0.099(0.704) | -0.195(0.453) | -0.246(0.342) | 0.246(0.342) | 0.098(0.708) | -0.052(0.842) | 0.021(0.936) | -0.048(0.856) |
| **b-2. PD Patients (N=19)** |
| *Correlation coefficient R**(p-value)* |
|  Delayed Memory |  Working Memory |
|  | Low-Load | Low-Load with Distractor | High-Load | Memory Load 2 | Memory Load 3 | Memory Load 4 | Memory Load 5 | Memory Load 6 |
| R. inferior Frontal-Opercular | -0.243(0.348) | -0.073(0.779) | 0.255(0.323) | 0.262(0.309) | 0.094(0.719) | 0.227(0.381) | 0.009(0.971) | **0.681\*****(0.003)** |
| R. Inferior Frontal-Triangular | -0.118(0.652) | -0.034(0.896) | -0.288(0.262) | -0.077(0.768) | -0.183(0.482) | -0.308(0.229) | -0.421(0.093) | 0.026(0.920) |
| R. middle FrontalGyrus | 0.082(0.754) | 0.052(0.842) | 0.123(0.637) | 0.190(0.465) | 0.368(0.147) | 0.227(0.381) | 0.005(0.984) | 0.168(0.520) |
| R. AngularGyrus | 0.027(0.917) | 0.217(0.404) | -0.038(0.884) | 0.203(0.436) | 0.148(0.571) | 0.086(0.743) | -0.098(0.709) | 0.238(0.358) |
| R. Supra-marginalgyrus | -0.071(0.786) | 0.149(0.569) | 0.227(0.381) | 0.365(0.150) | 0.217(0.403) | 0.240(0.353) | 0.005(0.984) | **0.0570****(0.017)** |
| R. superiorTemporalGyrus | -0.002(0.993) | 0.125(0.634) | 0.004(0.988) | **0.514****(0.035)** | 0.279(0.278) | 0.369(0.145) | 0.218(0.402) | 0.104(0.690) |
| R. superiorFrontalgyrus | 0.232(0.370) | 0.253(0.327) | 0.134(0.608) | **0.550****(0.022)** | **0.568\*****(0.017)** | 0.370(0.144) | 0.217(0.402) | 0.107(0.684) |
| R. superiorParietalGyrus | 0.375(0.138) | 0.417(0.096) | 0.295(0.251) | **0.568****(0.017)** | **0.630\*****(0.007)** | 0.386(0.126) | 0.239(0.356) | 0.297(0.248) |
| R. Intra-parietalSulcus | **0.490****(0.046)** | 0.438(0.079) | 0.115(0.659) | 0.442(0.076) | **0.574\*****(0.016)** | 0.447(0.072) | 0.395(0.117) | **0.569****(0.017)** |
| R. EntorhinalCortex | -0.202(0.438) | -0.004(0.989) | -0.324(0.204) | 0.110(0.673) | -0.039(0.882) | 0.017(0.948) | -0.032(0.902) | -0.030(0.908) |
| R. Para-hippocampalGyrus | -0.202(0.436) | -0.055(0.834) | 0.088(0.737) | 0.025(0.924) | 0.070(0.788) | 0.070(0.790) | -0.130(0.618) | 0.219(0.398) |
| R. hippocampalvolume | -0.086(0.744) | -0.030(0.910) | -0.304(0.235) | 0.289(0.261) | 0.072(0.784) | -0.029(0.913) | -0.031(0.906) | -0.091(0.729) |

Association analysis results showing Pearson correlation coefficient R (p-value). \* indicates significant result at *FWER*=0.05. Association analyses were conducted with adjustment for age and education.