

Supplementary Material

| | lhi | rhi | lam | ram |
|--------------|----------------|----------------|----------------|----------------|
| AD-e3 | -1.333 (1.686) | -1.219 (1.513) | -1.137 (1.458) | -0.887 (1.443) |
| AD-e4 | -1.859 (1.142) | -1.775 (1.231) | -1.387 (1.189) | -1.197 (1.244) |
| AD-YO-e3 | -1.039 (1.867) | -0.868 (1.505) | -0.825 (1.357) | -0.545 (1.379) |
| AD-YO-e4 | -1.936 (1.096) | -1.979 (1.089) | -1.441 (0.844) | -1.432 (0.988) |
| AD-VO-e3 | -1.614 (1.479) | -1.554 (1.474) | -1.435 (1.519) | -1.215 (1.456) |
| AD-VO-e4 | -1.688 (1.244) | -1.319 (1.417) | -1.269 (1.747) | -0.673 (1.581) |
| MCI-e3 | -0.657 (1.361) | -0.491 (1.289) | -0.518 (1.444) | -0.200 (1.261) |
| MCI-e4 | -1.123 (1.212) | -1.037 (1.207) | -0.806 (1.257) | -0.709 (1.196) |
| MCI-YO-e3 | -0.437 (1.449) | -0.379 (1.348) | -0.441 (1.273) | -0.242 (1.183) |
| MCI-YO-e4 | -1.173 (1.203) | -1.129 (1.133) | -0.836 (1.085) | -0.825 (1.062) |
| MCI-VO-e3 | -0.873 (1.241) | -0.602 (1.228) | -0.594 (1.601) | -0.158 (1.342) |
| MCI-VO-e4 | -0.975 (1.242) | -0.768 (1.383) | -0.718 (1.678) | -0.373 (1.489) |
| MCI-C-e3 | -0.920 (1.554) | -0.711 (1.519) | -0.697 (1.654) | -0.240 (1.427) |
| MCI-C-e4 | -1.431 (1.128) | -1.341 (1.134) | -1.152 (1.149) | -0.936 (1.102) |
| MCI-C-YO-e3 | -0.547 (1.712) | -0.610 (1.643) | -0.577 (1.271) | -0.390 (1.279) |
| MCI-C-YO-e4 | -1.410 (1.131) | -1.305 (1.093) | -1.058 (1.058) | -0.938 (1.058) |
| MCI-C-VO-e3 | -1.219 (1.378) | -0.792 (1.442) | -0.793 (1.928) | -0.121 (1.551) |
| MCI-C-VO-e4 | -1.501 (1.148) | -1.461 (1.288) | -1.465 (1.401) | -0.932 (1.271) |
| MCI-NC-e3 | -0.512 (1.229) | -0.371 (1.135) | -0.420 (1.315) | -0.177 (1.169) |
| MCI-NC-e4 | -0.784 (1.219) | -0.703 (1.204) | -0.426 (1.269) | -0.460 (1.253) |
| MCI-NC-YO-e3 | -0.385 (1.330) | -0.272 (1.194) | -0.378 (1.284) | -0.173 (1.145) |
| MCI-NC-YO-e4 | -0.895 (1.237) | -0.922 (1.155) | -0.575 (1.068) | -0.691 (1.062) |
| MCI-NC-VO-e3 | -0.652 (1.107) | -0.480 (1.071) | -0.466 (1.363) | -0.182 (1.210) |
| MCI-NC-VO-e4 | -0.501 (1.153) | -0.144 (1.172) | -0.045 (1.649) | 0.129 (1.520) |

Supplementary Table 1. Mean volumetric atrophy measurement and the standard deviation (listed in the parenthesis) of each structure of interest (lhi – left hippocampus; rhi – right hippocampus; lam – left amygdala; ram – right amygdala) for each group using the standardized z-scores derived from their age-matched healthy control counterparts.

| | MCI-NC-e3 vs. MCI-NC-e4 | | MCI-NC-YO-e3 vs. MCI-NC-YO-e4 | | MCI-NC-VO-e3 vs. MCI-NC-VO-e4 | |
|-----|-------------------------|-----------------|-------------------------------|----------------|-------------------------------|-----------------|
| | volume | shape | volume | shape | volume | shape |
| lhi | 0.2365 (0.272) | 0.4865 (0.105) | 0.1245 (0.509) | 0.1970 (0.189) | 0.7550 (-0.151) | 0.9905 (-0.006) |
| rhi | 0.1105 (0.332) | 0.0289 (0.185) | 0.0241 (0.651) | 0.0597 (0.317) | 0.3545 (-0.337) | 0.6715 (-0.085) |
| lam | 0.8205 (0.006) | 0.9325 (-0.029) | 0.7495 (0.198) | 0.5215 (0.085) | 0.5695 (-0.421) | 0.2670 (-0.123) |
| ram | 0.2265 (0.283) | 0.0171 (0.218) | 0.086 (0.518) | 0.0375 (0.303) | 0.7080 (-0.311) | 0.6705 (-0.002) |

Supplementary Table 2. The p -values the mean z-score between-group differences (listed inside the parenthesis) obtained from both the volume and the shape analysis of differences between the $\epsilon 4$ carriers and non-carriers within the entire MCI non-converter (MCI-NC) group, the young-old MCI-NC (MCI-NC-YO) group, and the very-old MCI-NC (MCI-NC-VO) group respectively. None of those comparisons has reached statistical significance at the level of $p = 0.05$ but not at $p = 0.0125$. For the mean z-score difference, the more positive, the more atrophy there is in the latter group, and the more negative, the more atrophy there is in the former group. Key: lhi – left hippocampus, rhi – right hippocampus, lam – left amygdala, ram – right amygdala.