**Supplementary File 1**

*Sensitivity Analyses*

Sensitivity analyses were undertaken for the primary hypotheses, to determine whether the reported findings were dependent on i) exclusion of participants with mild cognitive impairment (MCI) who had other neurological abnormalities, or ii) inclusion of participants with existing MCI prior to wave 4 of the Personality and Total Health (PATH) Through Life longitudinal study.

*Sensitivity Analysis 1 – Re-analysis using full cohort of participants with Mild Cognitive Impairment*

This analysis compared decision-making performance scores for 116 participants with MCI (including those with other neurological abnormalities stroke *n* = 7, Parkinson’s disease *n* = 3, or missing data on comorbidity flags *n* = 3) to the 142 older adults without MCI. As in the primary analysis there were no significant differences on GDT net scores and significantly higher numbers of single number choices among people with MCI, compared to older adults without MCI. However while the main analysis found a significantly higher number of strategy changes among people with MCI than those without MCI, for the first sensitivity analysis this result was not upheld (see Table S1).

*Table S1: Game of Dice Task performance measures by diagnostic grouping.*

|  |  | Cognitively unimpaired  (*n* = 142) | Mild cognitive impairment  (*n* = 116) | Test statistic | *p* | Effect size |
| --- | --- | --- | --- | --- | --- | --- |
| Net Score | M (SD) | 4.27 (10.3) | 2.62 (10.0) | *W* = 9,070 | .161 | - |
| Single number choices | M (SD) | 3.00 (3.74) | 3.66 (3.80) | *W* = 7,082 | .048 | *r*2 = .12 |
| Strategy changes | M (SD) | 4.65 (3.27) | 5.36 (3.41) | *W* = 7,192 | .078 | *-* |

*Note.* Test statistic and effect size results refer to independent paired samples tests between cognitively unimpaired (*n* = 142) and mild cognitive impairment (*n* = 116) groups. For the GDT net score measure (-18 minimum to 18 maximum) higher scores reflect higher levels of performance. For the frequency of single number choices (0 minimum to 18 maximum) and strategy changes (0 minimum to 17 maximum) lower scores reflect higher levels of performance.

*W* = Wilcoxon rank sum test, *r*2 = effect size coefficient (*r*2 < 0.3 = small effect)

*Sensitivity Analysis 2 – Re-analysis using sub-sample of participants with Mild Cognitive Impairment incident at wave 4*

This analysis compared decision-making performance scores for 88 participants with MCI (identified for the first time at wave 4 of the PATH study) to the 142 older adults without MCI. As expected a higher proportion of those with multi-domain aMCI (aMCI-multi) at wave 4 were excluded due to having a pre-existing diagnosis of MCI at wave 3 than the single-domain aMCI (aMCI-single) or non-amnestic MCI (naMCI) sub-types (8/31 aMCI-multi vs 5/38 aMCI-single vs 2/33 naMCI, (χ2 (2, N = 88) = 1105, *p* < .001)). As in the main analysis there were no significant differences in GDT net scores, and there were a higher number of single number choices among participants with MCI than older adults without MCI. However while the main analysis found a significantly higher number of strategy changes among people with MCI than those without MCI, for the first sensitivity analysis this result was not upheld (see Table S2).

*Table S2: Game of Dice Task performance measures by diagnostic grouping.*

|  |  | Cognitively unimpaired  (*n* = 142) | Mild cognitive impairment  (*n* = 88) | Test statistic | *p* | Effect size |
| --- | --- | --- | --- | --- | --- | --- |
| Net Score | M (SD) | 4.27 (10.3) | 2.48 (10.2) | *W* = 6,920 | .17 | - |
| Single number choices | M (SD) | 3.00 (3.74) | 3.86 (4.03) | *W* = 5,286 | .045 | *r*2 = .10 |
| Strategy changes | M (SD) | 4.65 (3.27) | 5.49 (3.48) | *W* = 5,338 | .062 | - |

*Note.* Test statistic and effect size results refer to independent paired samples tests between cognitively unimpaired (*n* = 142) and mild cognitive impairment (*n* = 88) groups. For the GDT net score measure (-18 minimum to 18 maximum) higher scores reflect higher levels of performance. For the frequency of single number choices (0 minimum to 18 maximum) and strategy changes (0 minimum to 17 maximum) lower scores reflect higher levels of performance.

*W* = Wilcoxon rank sum test, *r*2 = effect size coefficient (*r*2 < 0.3 = small effect)