**Supplemental Materials**

**Table S.1**

*Regression output with baseline math computation predicted by baseline demographics, cognitive reserve, and brain, as well as interactions between cognitive reserve and brain*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *estimate* | *SE* | *t* | *p* |
| Age | 0.05 | 0.12 | 0.43 | .669 |
| Gender | -0.17 | 0.18 | -0.94 | .350 |
| BL CR | 0.50 | 0.07 | 7.10 | <.001 |
| BL Grey Matter Volume | 0.24 | 0.12 | 2.08 | .040 |
| BL Hippocampal Volume | 0.06 | 0.10 | 0.57 | .568 |
| BL WMH | -0.07 | 0.08 | -0.96 | .337 |
| BL CR x BL Grey Matter Volume | -0.08 | 0.10 | -0.88 | .384 |
| BL CR x BL Hippocampal Volume | 0.08 | 0.09 | 0.89 | .376 |
| BL CR x BL WMH | -0.03 | 0.08 | -0.33 | .741 |

*Note.* BL = Baseline (measured at first MRI scan). CR = cognitive reserve WMH = white matter hypointensity. All brain variables were corrected for total intracranial volume. White matter hypointensity volumes were log-transformed. All variables z-transformed except age and gender. Gender variable coded as 0 for male, 1 for female. “x” denotes interaction terms.

**Table S.2**

*Regression output with longitudinal change in math computation predicted by demographics, cognitive reserve (baseline and change), and brain (baseline and change), as well as longitudinal interactions between cognitive reserve and brain*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *estimate* | *SE* | *t* | *p* |
| Age | -0.11 | 0.04 | -2.43 | .017 |
| Gender | 0.02 | 0.07 | 0.24 | .809 |
| BL CR | -0.04 | 0.03 | -1.44 | .153 |
| BL Grey Matter Volume | -0.03 | 0.04 | -0.64 | .524 |
| BL Hippocampal Volume | 0.01 | 0.03 | 0.42 | .678 |
| BL WMH Volume | -.001 | 0.04 | -0.04 | .972 |
| Δ CR | -0.02 | 0.03 | -0.66 | .513 |
| Δ Grey Matter Volume | -0.07 | 0.07 | -1.07 | .289 |
| Δ Hippocampal Volume | 0.13 | 0.07 | 1.80 | .076 |
| Δ WMH Volume | -0.05 | 0.07 | -0.62 | .536 |
| CR Change x Δ Grey Matter Volume | 0.03 | 0.04 | 0.75 | .453 |
| CR Change x Δ Hippocampal Volume | -0.08 | 0.05 | -1.55 | .123 |
| CR Change x Δ WMH | 0.04 | 0.05 | 0.75 | .454 |

*Note.* BL = Baseline (measured at first MRI scan). CR = cognitive reserve WMH = white matter hypointensity. Δ = change from first to last MRI scan. “x” denotes interaction terms. All brain variables were corrected for total intracranial volume. White matter hypointensity volumes were log-transformed. All variables z-transformed except age and gender. Gender variable coded as 0 for male, 1 for female. “x” denotes interaction terms.

**Table S.3**

*Regression output with baseline word reading predicted by baseline demographics, cognitive reserve, and brain, as well as interactions between cognitive reserve and brain*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *estimate* | *SE* | *t* | *p* |
| Age | -0.12 | 0.18 | -0.68 | .504 |
| Gender | -0.06 | 0.22 | -0.29 | .773 |
| BL Cognitive Reserve | 0.25 | 0.09 | 2.70 | .008 |
| BL Grey Matter Volume | 0.38 | 0.15 | 2.50 | .014 |
| BL Hippocampal Volume | -0.11 | 0.13 | -0.86 | .392 |
| BL WMH | -0.11 | 0.10 | -1.06 | .295 |
| BL CR x BL GMV | -0.21 | 0.13 | -1.71 | .092 |
| BL CR x BL HCV | 0.17 | 0.12 | 1.46 | .148 |
| BL CR x BL WMH | -0.03 | 0.11 | -0.28 | .783 |

*Note.* BL = Baseline (measured at first MRI scan). CR = cognitive reserve WMH = white matter hypointensity. All brain variables were corrected for total intracranial volume. White matter hypointensity volumes were log-transformed. All variables z-transformed except age and gender. Gender variable coded as 0 for male, 1 for female. “x” denotes interaction terms.

**Table S.4**

*Regression output with longitudinal change in word reading predicted by demographics, cognitive reserve (baseline and change), and brain (baseline and change), as well as longitudinal interactions between cognitive reserve and brain*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *estimate* | *SE* | *t* | *p* |
| Age | -0.04 | 0.04 | -0.88 | .383 |
| Gender | 0.04 | 0.06 | 0.75 | .454 |
| BL CR | 0.02 | 0.03 | 0.82 | .413 |
| BL Grey Matter Volume | -0.01 | 0.04 | -0.26 | .795 |
| BL Hippocampal Volume | -0.02 | 0.03 | -0.51 | .611 |
| BL WMH Volume | 0.05 | 0.03 | 1.79 | .077 |
| Δ CR | 0.10 | 0.03 | 3.82 | <.001 |
| Δ Grey Matter Volume | -0.08 | 0.06 | -1.51 | .134 |
| Δ Hippocampal Volume | 0.09 | 0.06 | 1.35 | .182 |
| Δ WMH Volume | 0.05 | 0.06 | 0.79 | .433 |
| CR Change x Δ Grey Matter Volume | -0.02 | 0.04 | -0.51 | .616 |
| CR Change x Δ Hippocampal Volume | -0.02 | 0.05 | -0.32 | .747 |
| CR Change x Δ WMH | 0.10 | 0.05 | 2.23 | .029 |

*Note.* BL = Baseline (measured at first MRI scan). CR = cognitive reserve WMH = white matter hypointensity. Δ = change from first to last MRI scan. All brain variables were corrected for total intracranial volume. White matter hypointensity volumes were log-transformed. All variables z-transformed except age and gender. Gender variable coded as

0 for male, 1 for female.