**<TC>Appendix Table 1.** Means and standard errors of random effects for level and change in cognitive performance in overall and multiple group models: Results from WHICAP (*N* = 4073)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| <TB> |  | Level (age 75) | | |  | Annual rate of change | | |
| Sample | Cognitive outcome | Mean | *SE* | Mean / *SE* |  | Mean | *SE* | Mean / *SE* |
| **Overall sample** |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 45.98 | 0.18 | 261.57 |  | -0.47 | 0.01 | -69.15 |
|  | Memory | 50.33 | 0.18 | 275.41 |  | -0.54 | 0.01 | -55.67 |
|  | Executive functioning | 45.41 | 0.16 | 281.23 |  | -0.42 | 0.01 | -56.15 |
|  | Language | 45.46 | 0.20 | 225.36 |  | -0.38 | 0.01 | -43.36 |
|  |  |  |  |  |  |  |  |  |
| **Race/ethnicity** |  |  |  |  |  |  |  |  |
| Non-Hispanic White (*n* = 1013) | |  |  |  |  |  |  |  |
|  | General cognitive performance | 51.08 | 0.58 | 87.93 |  | -0.66 | 0.02 | -28.11 |
|  | Memory | 53.98 | 0.80 | 67.77 |  | -0.73 | 0.05 | -16.31 |
|  | Executive functioning | 50.44 | 0.48 | 104.58 |  | -0.64 | 0.03 | -23.27 |
|  | Language | 50.14 | 0.86 | 58.24 |  | -0.53 | 0.05 | -11.65 |
| Non-Hispanic Black (*n* = 1372) | |  |  |  |  |  |  |  |
|  | General cognitive performance | 45.39 | 0.42 | 107.71 |  | -0.60 | 0.02 | -32.39 |
|  | Memory | 49.19 | 0.45 | 108.56 |  | -0.69 | 0.03 | -20.60 |
|  | Executive functioning | 44.81 | 0.38 | 118.02 |  | -0.51 | 0.03 | -20.67 |
|  | Language | 45.53 | 0.51 | 89.92 |  | -0.48 | 0.03 | -15.91 |
| Hispanic (*n* = 1688) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 43.42 | 0.34 | 129.48 |  | -0.54 | 0.01 | -38.78 |
|  | Memory | 48.87 | 0.35 | 140.10 |  | -0.60 | 0.02 | -26.25 |
|  | Executive functioning | 43.02 | 0.30 | 143.82 |  | -0.46 | 0.02 | -24.42 |
|  | Language | 42.49 | 0.38 | 111.69 |  | -0.45 | 0.02 | -20.44 |
| **Sex** |  |  |  |  |  |  |  |  |
| Male (*N* = 1283) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 46.08 | 0.42 | 109.73 |  | -0.60 | 0.02 | -33.68 |
|  | Memory | 49.35 | 0.46 | 106.49 |  | -0.67 | 0.04 | -18.63 |
|  | Executive functioning | 46.16 | 0.38 | 122.55 |  | -0.58 | 0.03 | -22.15 |
|  | Language | 46.19 | 0.53 | 87.59 |  | -0.48 | 0.03 | -14.54 |
| Female (*N* = 2790) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 45.86 | 0.35 | 130.47 |  | -0.58 | 0.01 | -54.15 |
|  | Memory | 50.66 | 0.37 | 136.63 |  | -0.65 | 0.02 | -33.44 |
|  | Executive functioning | 45.07 | 0.32 | 139.99 |  | -0.50 | 0.01 | -37.12 |
|  | Language | 45.00 | 0.44 | 102.47 |  | -0.49 | 0.02 | -27.57 |
| **Age** |  |  |  |  |  |  |  |  |
| Under 75 (*n* = 1667) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 50.31 | 0.52 | 97.68 |  | -0.56 | 0.02 | -35.83 |
|  | Memory | 54.86 | 0.57 | 95.64 |  | -0.64 | 0.03 | -20.74 |
|  | Executive functioning | 48.64 | 0.47 | 104.47 |  | -0.52 | 0.02 | -24.42 |
|  | Language | 49.27 | 0.67 | 73.07 |  | -0.45 | 0.03 | -16.05 |
| Age 75 to 80 (*n* = 1158) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 45.82 | 0.43 | 106.50 |  | -0.62 | 0.02 | -34.67 |
|  | Memory | 49.93 | 0.45 | 110.65 |  | -0.68 | 0.03 | -23.31 |
|  | Executive functioning | 45.10 | 0.38 | 120.41 |  | -0.53 | 0.02 | -24.08 |
|  | Language | 45.38 | 0.51 | 88.26 |  | -0.50 | 0.03 | -16.28 |
| 80 and over (*n* = 1248) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 39.47 | 0.37 | 107.29 |  | -0.85 | 0.03 | -32.92 |
|  | Memory | 44.00 | 0.36 | 122.47 |  | -0.85 | 0.04 | -20.52 |
|  | Executive functioning | 40.88 | 0.33 | 123.47 |  | -0.60 | 0.03 | -18.92 |
|  | Language | 39.31 | 0.40 | 98.37 |  | -0.73 | 0.04 | -20.63 |
| **Years of education** |  |  |  |  |  |  |  |  |
| 7 years or less (*n* = 1883) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 41.63 | 0.28 | 148.08 |  | -0.53 | 0.01 | -41.25 |
|  | Memory | 47.29 | 0.30 | 158.67 |  | -0.59 | 0.02 | -27.75 |
|  | Executive functioning | 41.28 | 0.25 | 168.32 |  | -0.42 | 0.02 | -22.73 |
|  | Language | 40.45 | 0.30 | 137.00 |  | -0.41 | 0.02 | -19.92 |
| 8 or more years (*n* = 2179) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 50.19 | 0.36 | 138.16 |  | -0.65 | 0.02 | -44.29 |
|  | Memory | 53.32 | 0.45 | 118.60 |  | -0.73 | 0.03 | -26.71 |
|  | Executive functioning | 49.46 | 0.33 | 151.87 |  | -0.62 | 0.02 | -34.84 |
|  | Language | 50.06 | 0.50 | 100.96 |  | -0.55 | 0.03 | -21.40 |
| **APOE ε4 status** |  |  |  |  |  |  |  |  |
| No ε4 allele (*n* = 3151) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 45.74 | 0.31 | 147.42 |  | -0.54 | 0.01 | -51.44 |
|  | Memory | 50.15 | 0.34 | 147.20 |  | -0.60 | 0.02 | -29.77 |
|  | Executive functioning | 45.22 | 0.28 | 160.39 |  | -0.49 | 0.01 | -35.13 |
|  | Language | 45.05 | 0.39 | 116.27 |  | -0.43 | 0.02 | -22.25 |
| Possesses ε4 allele (*n* = 922) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 46.70 | 0.63 | 73.85 |  | -0.72 | 0.02 | -32.52 |
|  | Memory | 50.88 | 0.63 | 80.48 |  | -0.79 | 0.03 | -23.22 |
|  | Executive functioning | 46.10 | 0.56 | 82.71 |  | -0.63 | 0.03 | -22.49 |
|  | Language | 46.52 | 0.77 | 60.14 |  | -0.63 | 0.03 | -21.08 |
| **Baseline cognitive status** |  |  |  |  |  |  |  |  |
| Quartile 1 (*n* = 1036) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 32.56 | 0.22 | 147.40 |  | -0.30 | 0.03 | -9.83 |
|  | Memory | 38.14 | 0.22 | 173.33 |  | -0.19 | 0.04 | -4.72 |
|  | Executive functioning | 35.54 | 0.21 | 170.22 |  | -0.22 | 0.04 | -5.41 |
|  | Language | 33.11 | 0.25 | 132.54 |  | -0.27 | 0.04 | -6.92 |
| Quartile 2 (*n* = 1013) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 43.28 | 0.27 | 161.40 |  | -0.49 | 0.02 | -20.18 |
|  | Memory | 47.47 | 0.33 | 142.64 |  | -0.48 | 0.04 | -12.13 |
|  | Executive functioning | 42.77 | 0.27 | 158.56 |  | -0.40 | 0.03 | -13.83 |
|  | Language | 42.42 | 0.33 | 128.20 |  | -0.42 | 0.04 | -12.08 |
| Quartile 3 (*n* = 1013) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 49.56 | 0.30 | 167.47 |  | -0.59 | 0.03 | -22.86 |
|  | Memory | 53.37 | 0.39 | 135.31 |  | -0.65 | 0.04 | -16.65 |
|  | Executive functioning | 47.65 | 0.31 | 156.26 |  | -0.51 | 0.03 | -17.00 |
|  | Language | 48.54 | 0.44 | 110.17 |  | -0.47 | 0.04 | -10.67 |
| Quartile 4 (*n* = 1011) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 58.27 | 0.41 | 142.98 |  | -0.71 | 0.02 | -37.36 |
|  | Memory | 62.22 | 0.64 | 96.75 |  | -0.83 | 0.04 | -20.31 |
|  | Executive functioning | 55.44 | 0.35 | 156.67 |  | -0.66 | 0.02 | -26.98 |
|  | Language | 57.06 | 0.61 | 93.11 |  | -0.54 | 0.03 | -16.61 |
| **Cardiovascular risk burden** |  |  |  |  |  |  |  |  |
| Zero (*n* = 884) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 47.53 | 0.56 | 84.47 |  | -0.62 | 0.02 | -32.90 |
|  | Memory | 51.25 | 0.54 | 95.88 |  | -0.69 | 0.03 | -23.21 |
|  | Executive functioning | 47.30 | 0.52 | 90.38 |  | -0.55 | 0.02 | -23.89 |
|  | Language | 47.21 | 0.67 | 70.21 |  | -0.50 | 0.03 | -14.64 |
| One (*n* = 1414) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 45.95 | 0.53 | 86.24 |  | -0.58 | 0.02 | -26.40 |
|  | Memory | 50.73 | 0.61 | 83.40 |  | -0.67 | 0.04 | -15.32 |
|  | Executive functioning | 45.03 | 0.47 | 95.34 |  | -0.50 | 0.03 | -18.96 |
|  | Language | 45.11 | 0.63 | 71.75 |  | -0.45 | 0.03 | -14.64 |
| Two (*n* = 1167) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 44.29 | 0.64 | 69.65 |  | -0.55 | 0.02 | -26.47 |
|  | Memory | 48.56 | 0.67 | 72.52 |  | -0.58 | 0.04 | -13.45 |
|  | Executive functioning | 44.29 | 0.57 | 77.43 |  | -0.52 | 0.03 | -16.63 |
|  | Language | 43.86 | 0.83 | 52.59 |  | -0.50 | 0.04 | -13.34 |
| Three or more (*n* = 608) |  |  |  |  |  |  |  |  |
|  | General cognitive performance | 43.39 | 0.94 | 46.38 |  | -0.48 | 0.05 | -10.49 |
|  | Memory | 47.76 | 1.04 | 46.03 |  | -0.51 | 0.09 | -5.52 |
|  | Executive functioning | 43.29 | 0.78 | 55.45 |  | -0.49 | 0.05 | -9.44 |
|  | Language | 43.31 | 1.12 | 38.64 |  | -0.38 | 0.08 | -5.09 |

<TC>**Appendix Table 2.** Retest effects for general and domain-specific cognitive performance parameterizing retest as the square root of prior visits: Results from WHICAP (*N* = 4073)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| <TB>Parameter | General cognitive performance | Memory | Executive functioning | Language |
|  | Estimate [95% CI] | Estimate [95% CI] | Estimate [95% CI] | Estimate [95% CI] |
| **Race/ethnicity** |  |  |  |  |
| Non-Hispanic White (*n* = 1013) | 4.67\* [2.69, 6.65] | 5.48\* [2.70, 8.26] | 3.14\* [1.26, 5.02] | 5.39\* [3.41, 7.37] |
| Non-Hispanic Black (*n* = 1372) | 4.09\* [2.48, 5.70] | 3.71\* [2.00, 5.42] | 3.80\* [2.33, 5.27] | 3.74\* [1.62, 5.86] |
| Hispanic (*n* = 1688) | 3.26\* [2.20, 4.32] | 3.16\* [2.02, 4.30] | 2.10\* [1.00, 3.20] | 3.36\* [2.05, 4.67] |
| Group differences |  |  |  |  |
| White - Black | 0.58 [-1.97, 3.13] | 1.77 [-1.50, 5.04] | -0.66 [-3.03, 1.71] | 1.65 [-1.25, 4.55] |
| White - Hispanic | 1.41 [-0.82, 3.64] | 2.33 [-0.69, 5.35] | 1.04 [-1.14, 3.22] | 2.03 [-0.34, 4.40] |
| Black - Hispanic | 0.84 [-1.10, 2.78] | 0.56 [-1.50, 2.62] | 1.70 [-0.12, 3.52] | 0.39 [-2.10, 2.88] |
| Pseudo-R2 | 0.896 | 0.803 | 0.814 | 0.856 |
| **Age** |  |  |  |  |
| Under 75 (*n* = 1667) | 2.84\* [1.19, 4.49] | 2.74\* [0.84, 4.64] | 2.61\* [1.02, 4.20] | 3.34\* [1.36, 5.32] |
| Age 75 to 80 (*n* = 1158) | 3.39\* [1.72, 5.06] | 3.41\* [1.55, 5.27] | 2.77\* [1.16, 4.38] | 3.04\* [0.55, 5.53] |
| 80 and over (*n* = 1248) | 3.79\* [2.65, 4.93] | 3.22\* [2.12, 4.32] | 1.93\* [0.91, 2.95] | 3.99\* [2.77, 5.21] |
| Group differences |  |  |  |  |
| Under 75 - (75 to 80) | -0.55 [-2.88, 1.78] | -0.67 [-3.34, 2.00] | -0.16 [-2.41, 2.09] | 0.30 [-2.88, 3.48] |
| Under 75 - Over 80 | -0.95 [-2.95, 1.05] | -0.48 [-2.68, 1.72] | 0.68 [-1.20, 2.56] | -0.65 [-2.98, 1.68] |
| (75 to 80) - Over 80 | -0.40 [-2.42, 1.62] | 0.19 [-1.99, 2.37] | 0.84 [-1.06, 2.74] | -0.95 [-3.73, 1.83] |
| Pseudo-R2 | 0.898 | 0.803 | 0.814 | 0.858 |
| **Sex** |  |  |  |  |
| Male (*N* = 1283) | 3.67\* [2.04, 5.30] | 3.21\* [1.33, 5.09] | 3.27\* [1.78, 4.76] | 4.43\* [2.47, 6.39] |
| Female (*N* = 2790) | 4.54\* [3.38, 5.70] | 4.61\* [3.39, 5.83] | 3.35\* [2.17, 4.53] | 4.49\* [3.14, 5.84] |
| Group differences |  |  |  |  |
| Female - Male | 0.87 [-1.13, 2.87] | 1.40 [-0.83, 3.63] | 0.08 [-1.82, 1.98] | 0.06 [-2.31, 2.43] |
| Pseudo-R2 | 0.896 | 0.803 | 0.813 | 0.856 |
| **Predominant language spoken at home** | |  |  |  |
| English (*n* = 1572) | 3.53\* [2.10, 4.96] | 3.21\* [1.70, 4.72] | 2.47\* [0.90, 4.04] | 3.94\* [2.20, 5.68] |
| Non-English (*N* = 1009) | 5.53\* [3.94, 7.12] | 5.76\* [3.78, 7.74] | 4.76\* [3.19, 6.33] | 5.66\* [3.68, 7.64] |
| Group differences |  |  |  |  |
| English - Non-English | 2.01 [-0.11, 4.13] | 2.55 [0.06, 5.04] | 2.28 [0.05, 4.51] | 1.72 [-0.93, 4.37] |
| Pseudo-R2 | 0.88 | 0.781 | 0.807 | 0.846 |
| **Years of education** |  |  |  |  |
| 7 years or less (*n* = 1883) | 3.24\* [2.36, 4.12] | 3.01\* [2.05, 3.97] | 2.24\* [1.36, 3.12] | 3.23\* [2.23, 4.23] |
| 8 or more years (*n* = 2179) | 4.36\* [3.20, 5.52] | 4.56\* [3.07, 6.05] | 3.41\* [2.29, 4.53] | 4.51\* [3.22, 5.80] |
| Group differences |  |  |  |  |
| (8 or more years) - (7 years or less) | 1.12 [-0.33, 2.57] | 1.55 [-0.23, 3.33] | 1.17 [-0.24, 2.58] | 1.29 [-0.34, 2.92] |
| Pseudo-R2 | 0.896 | 0.803 | 0.813 | 0.856 |
| **APOE ε4 status** |  |  |  |  |
| No ε4 allele (*n* = 3151) | 4.32\* [3.22, 5.42] | 4.22\* [3.00, 5.44] | 3.34\* [2.24, 4.44] | 4.55\* [3.33, 5.77] |
| Possesses ε4 allele (*n* = 922) | 3.99\* [1.95, 6.03] | 4.00\* [2.04, 5.96] | 3.06\* [1.20, 4.92] | 3.93\* [1.28, 6.58] |
| Group differences |  |  |  |  |
| (Possesses ε4) - (no ε4) | -0.33 [-2.64, 1.98] | -0.23 [-2.54, 2.08] | -0.27 [-2.43, 1.89] | -0.63 [-3.55, 2.29] |
| Pseudo-R2 | 0.897 | 0.804 | 0.815 | 0.857 |
| **Baseline cognitive status** |  |  |  |  |
| Quartile 1 (*n* = 1036) | 2.80\* [2.17, 3.43] | 2.62\* [1.95, 3.29] | 1.25\* [0.62, 1.88] | 1.87\* [1.11, 2.63] |
| Quartile 2 (*n* = 1013) | 0.36 [-0.25, 0.97] | 0.32 [-0.64, 1.28] | 0.42 [-0.38, 1.22] | 0.89 [-0.29, 2.07] |
| Quartile 3 (*n* = 1013) | -0.21 [-0.84, 0.42] | 0.06 [-0.80, 0.92] | -0.11 [-1.25, 1.03] | -0.06 [-1.29, 1.17] |
| Quartile 4 (*n* = 1011) | 0.52 [-1.69, 2.73] | 0.40 [-2.97, 3.77] | 0.42 [-1.38, 2.22] | 1.11 [-2.16, 4.38] |
| Group differences |  |  |  |  |
| Quartile1 - Quartile2 | 2.43\* [1.57, 3.29] | 2.30\* [1.14, 3.46] | 0.83 [-0.19, 1.85] | 0.98 [-0.43, 2.39] |
| Quartile1 - Quartile3 | 3.01\* [2.13, 3.89] | 2.55\* [1.47, 3.63] | 1.37\* [0.08, 2.66] | 1.93\* [0.48, 3.38] |
| Quartile1 - Quartile4 | 2.28 [-0.01, 4.57] | 2.21 [-1.24, 5.66] | 0.84 [-1.06, 2.74] | 0.75 [-2.60, 4.10] |
| Quartile2 - Quartile3 | 0.57 [-0.29, 1.43] | 0.26 [-1.01, 1.53] | 0.54 [-0.85, 1.93] | 0.95 [-0.76, 2.66] |
| Quartile2 - Quartile4 | -0.16 [-2.45, 2.13] | -0.08 [-3.59, 3.43] | 0.00 [-1.98, 1.98] | -0.22 [-3.69, 3.25] |
| Quartile3 - Quartile4 | -0.73 [-3.02, 1.56] | -0.34 [-3.83, 3.15] | -0.53 [-2.67, 1.61] | -1.17 [-4.66, 2.32] |
| Pseudo-R2 | 0.889 | 0.799 | 0.804 | 0.85 |
| **Cardiovascular risk burden** |  |  |  |  |
| Zero (*n* = 884) | 4.06\* [1.75, 6.37] | 4.71\* [2.40, 7.02] | 2.42\* [0.09, 4.75] | 4.17\* [1.33, 7.01] |
| One (*n* = 1414) | 4.69\* [3.08, 6.30] | 4.05\* [2.21, 5.89] | 4.03\* [2.50, 5.56] | 4.97\* [3.07, 6.87] |
| Two (*n* = 1167) | 3.92\* [2.14, 5.70] | 3.88\* [1.94, 5.82] | 2.93\* [0.95, 4.91] | 4.09\* [1.95, 6.23] |
| Three or more (*n* = 608) | 3.40\* [0.42, 6.38] | 3.35 [-0.57, 7.27] | 2.95\* [0.52, 5.38] | 3.45 [-0.57, 7.47] |
| Group differences |  |  |  |  |
| Zero - One | -0.64 [-3.46, 2.18] | 0.67 [-2.29, 3.63] | -1.61 [-4.41, 1.19] | -0.80 [-4.21, 2.61] |
| Zero - Two | 0.14 [-2.78, 3.06] | 0.84 [-2.18, 3.86] | -0.51 [-3.59, 2.57] | 0.08 [-3.47, 3.63] |
| Zero - Three | 0.66 [-3.12, 4.44] | 1.36 [-3.19, 5.91] | -0.52 [-3.89, 2.85] | 0.72 [-4.20, 5.64] |
| One - Two | 0.77 [-1.62, 3.16] | 0.17 [-2.50, 2.84] | 1.10 [-1.41, 3.61] | 0.88 [-1.98, 3.74] |
| One - Three | 1.29 [-2.10, 4.68] | 0.70 [-3.63, 5.03] | 1.08 [-1.80, 3.96] | 1.52 [-2.91, 5.95] |
| Two - Three | 0.52 [-2.95, 3.99] | 0.52 [-3.85, 4.89] | -0.01 [-3.15, 3.13] | 0.64 [-3.91, 5.19] |
| Pseudo-R2 | 0.897 | 0.803 | 0.815 | 0.857 |

<TFN>Retest here is parameterized as the square root of the number of prior test occasions to accommodate a diminishing returns conceptualization of practice. Multilevel models of changes for general cognitive performance, memory, executive functioning, and language using time in study as the timescale. The retest parameters correspond to β2 parameters in equation 4, and group differences correspond to parameter β4.

<TC>**Appendix Table 3.** Retest effects for general and domain-specific cognitive performance excluding participants with dementia at baseline: Results from WHICAP (*N* = 2849)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| <TB>Parameter | General cognitive performance | Memory | Executive functioning | Language |
|  | Estimate [95% CI] | Estimate [95% CI] | Estimate [95% CI] | Estimate [95% CI] |
| **Race/ethnicity** |  |  |  |  |
| Non-Hispanic White (*n* = 1013) | 3.26 [-0.74, 7.26] | 4.67 [-2.92, 12.26] | 2.26 [-0.52, 5.04] | 4.15\* [0.11, 8.19] |
| Non-Hispanic Black (*n* = 1372) | 3.10 [-1.06, 7.26] | 3.11 [-1.93, 8.15] | 3.74 [-0.08, 7.56] | 3.34 [-2.01, 8.69] |
| Hispanic (*n* = 1688) | 2.21 [-1.22, 5.64] | 2.60 [-1.18, 6.38] | 1.91 [-1.87, 5.69] | 3.03 [-1.54, 7.60] |
| Group differences |  |  |  |  |
| White - Black | 0.16 [-5.60, 5.92] | 1.56 [-7.53, 10.65] | -1.48 [-6.22, 3.26] | 0.81 [-5.89, 7.51] |
| White - Hispanic | 1.05 [-4.22, 6.32] | 2.07 [-6.42, 10.56] | 0.35 [-4.35, 5.05] | 1.12 [-4.98, 7.22] |
| Black - Hispanic | 0.89 [-4.50, 6.28] | 0.51 [-5.78, 6.80] | 1.83 [-3.56, 7.22] | 0.31 [-6.73, 7.35] |
| Pseudo-R2 | 0.86 | 0.75 | 0.79 | 0.83 |
| **Age** |  |  |  |  |
| Under 75 (*n* = 1667) | 3.39 [-0.84, 7.62] | 3.71 [-1.95, 9.37] | 3.23 [-0.73, 7.19] | 4.31 [-0.69, 9.31] |
| Age 75 to 80 (*n* = 1158) | 1.97 [-1.83, 5.77] | 2.42 [-3.22, 8.06] | 2.10 [-1.23, 5.43] | 2.07 [-3.28, 7.42] |
| 80 and over (*n* = 1248) | 2.18 [-0.51, 4.87] | 2.11 [-1.07, 5.29] | 1.84 [-0.61, 4.29] | 3.00 [-0.72, 6.72] |
| Group differences |  |  |  |  |
| Under 75 - (75 to 80) | 1.42 [-4.28, 7.12] | 1.29 [-6.71, 9.29] | 1.13 [-4.04, 6.30] | 2.25 [-5.08, 9.58] |
| Under 75 - Over 80 | 1.21 [-3.81, 6.23] | 1.60 [-4.89, 8.09] | 1.39 [-3.27, 6.05] | 1.32 [-4.91, 7.55] |
| (75 to 80) - Over 80 | -0.21 [-4.86, 4.44] | 0.31 [-6.16, 6.78] | 0.26 [-3.88, 4.40] | -0.93 [-7.46, 5.60] |
| Pseudo-R2 | 0.86 | 0.75 | 0.79 | 0.83 |
| **Sex** |  |  |  |  |
| Male (*N* = 1283) | 4.04\* [0.77, 7.31] | 3.86 [-0.33, 8.05] | 3.84\* [0.76, 6.92] | 5.06\* [0.89, 9.23] |
| Female (*N* = 2790) | 3.11 [-0.12, 6.34] | 3.89 [-0.48, 8.26] | 2.90 [-0.04, 5.84] | 3.69 [-0.19, 7.57] |
| Group differences |  |  |  |  |
| Female - Male | -0.93 [-5.52, 3.66] | 0.03 [-6.03, 6.09] | -0.94 [-5.19, 3.31] | -1.38 [-7.08, 4.32] |
| Pseudo-R2 | 0.90 | 0.80 | 0.81 | 0.86 |
| **Predominant language spoken at home** | |  |  |  |
| English (*n* = 1572) | 1.79 [-3.40, 6.98] | 1.88 [-3.39, 7.15] | 1.62 [-4.12, 7.36] | 2.91 [-3.85, 9.67] |
| Non-English (*N* = 1009) | 3.93 [-1.15, 9.01] | 4.73 [-2.62, 12.08] | 3.93 [-0.15, 8.01] | 4.29 [-2.28, 10.86] |
| Group differences |  |  |  |  |
| English - Non-English | 2.14 [-5.11, 9.39] | 2.84 [-6.22, 11.90] | 2.31 [-4.73, 9.35] | 1.38 [-8.05, 10.81] |
| Pseudo-R2 | 0.86 | 0.74 | 0.79 | 0.83 |
| **Years of education** |  |  |  |  |
| 7 years or less (*n* = 1883) | 1.87 [-0.50, 4.24] | 2.07 [-0.65, 4.79] | 1.87 [-0.78, 4.52] | 2.55 [-0.63, 5.73] |
| 8 or more years (*n* = 2179) | 3.34\* [0.48, 6.20] | 4.15 [-0.57, 8.87] | 2.98\* [0.78, 5.18] | 3.81\* [0.63, 6.99] |
| Group differences |  |  |  |  |
| (8 or more years) - (7 years or less) | 1.47 [-2.25, 5.19] | 2.07 [-3.38, 7.52] | 1.11 [-2.34, 4.56] | 1.26 [-3.23, 5.75] |
| Pseudo-R2 | 0.86 | 0.75 | 0.79 | 0.83 |
| **APOE ε4 status** |  |  |  |  |
| No ε4 allele (*n* = 3151) | 3.71\* [0.91, 6.51] | 4.22\* [0.59, 7.85] | 3.43\* [0.78, 6.08] | 4.48\* [1.19, 7.77] |
| Possesses ε4 allele (*n* = 922) | 1.98 [-3.92, 7.88] | 2.33 [-4.88, 9.54] | 1.97 [-3.05, 6.99] | 2.39 [-5.86, 10.64] |
| Group differences |  |  |  |  |
| (Possesses ε4) - (no ε4) | -1.73 [-8.26, 4.80] | -1.90 [-9.98, 6.18] | -1.46 [-7.12, 4.20] | -2.09 [-10.97, 6.79] |
| Pseudo-R2 | 0.86 | 0.75 | 0.79 | 0.83 |
| **Baseline cognitive status** |  |  |  |  |
| Quartile 1 (*n* = 1036) | 1.07 [-7.01, 9.15] | 1.32 [-7.77, 10.41] | 0.88 [-5.29, 7.05] | 1.25 [-14.94, 17.44] |
| Quartile 2 (*n* = 1013) | 0.35 [-1.39, 2.09] | 0.42 [-2.64, 3.48] | 0.74 [-1.53, 3.01] | 1.13 [-1.93, 4.19] |
| Quartile 3 (*n* = 1013) | -0.52 [-1.83, 0.79] | -0.59 [-2.65, 1.47] | 0.05 [-2.56, 2.66] | -0.50 [-3.15, 2.15] |
| Quartile 4 (*n* = 1011) | 0.33 [-2.39, 3.05] | 0.33 [-4.77, 5.43] | 0.40 [-1.91, 2.71] | 1.30 [-2.68, 5.28] |
| Group differences |  |  |  |  |
| Quartile1 - Quartile2 | 0.71 [-7.56, 8.98] | 0.89 [-8.69, 10.47] | 0.14 [-6.45, 6.73] | 0.12 [-16.36, 16.60] |
| Quartile1 - Quartile3 | 1.59 [-6.58, 9.76] | 1.91 [-7.40, 11.22] | 0.83 [-5.87, 7.53] | 1.75 [-14.66, 18.16] |
| Quartile1 - Quartile4 | 0.74 [-7.79, 9.27] | 0.99 [-9.44, 11.42] | 0.48 [-6.13, 7.09] | -0.05 [-16.73, 16.63] |
| Quartile2 - Quartile3 | 0.88 [-1.30, 3.06] | 1.01 [-2.67, 4.69] | 0.69 [-2.76, 4.14] | 1.63 [-2.41, 5.67] |
| Quartile2 - Quartile4 | 0.02 [-3.21, 3.25] | 0.10 [-5.84, 6.04] | 0.35 [-2.88, 3.58] | -0.18 [-5.20, 4.84] |
| Quartile3 - Quartile4 | -0.85 [-3.89, 2.19] | -0.91 [-6.40, 4.58] | -0.34 [-3.83, 3.15] | -1.80 [-6.58, 2.98] |
| Pseudo-R2 | 0.85 | 0.74 | 0.79 | 0.82 |
| **Cardiovascular risk burden** |  |  |  |  |
| Zero (*n* = 884) | 2.51 [-2.35, 7.37] | 3.81 [-3.03, 10.65] | 1.60 [-2.75, 5.95] | 3.00 [-3.43, 9.43] |
| One (*n* = 1414) | 3.69 [-0.94, 8.32] | 3.52 [-2.03, 9.07] | 3.90 [-0.39, 8.19] | 4.66 [-1.36, 10.68] |
| Two (*n* = 1167) | 3.24 [-4.11, 10.59] | 3.71 [-5.40, 12.82] | 2.95 [-3.87, 9.77] | 3.97 [-4.32, 12.26] |
| Three or more (*n* = 608) | 2.96 [-7.62, 13.54] | 3.54 [-11.30, 18.38] | 3.10 [-4.98, 11.18] | 3.24 [-9.72, 16.20] |
| Group differences |  |  |  |  |
| Zero - One | -1.18 [-7.88, 5.52] | 0.28 [-8.52, 9.08] | -2.31 [-8.43, 3.81] | -1.66 [-10.48, 7.16] |
| Zero - Two | -0.73 [-9.55, 8.09] | 0.10 [-11.29, 11.49] | -1.36 [-9.45, 6.73] | -0.96 [-11.45, 9.53] |
| Zero - Three | -0.46 [-12.10, 11.18] | 0.27 [-16.08, 16.62] | -1.51 [-10.68, 7.66] | -0.23 [-14.69, 14.23] |
| One - Two | 0.45 [-8.23, 9.13] | -0.19 [-10.85, 10.47] | 0.95 [-7.11, 9.01] | 0.70 [-9.55, 10.95] |
| One - Three | 0.72 [-10.82, 12.26] | -0.02 [-15.88, 15.84] | 0.80 [-8.33, 9.93] | 1.43 [-12.86, 15.72] |
| Two - Three | 0.27 [-12.61, 13.15] | 0.17 [-17.23, 17.57] | -0.15 [-10.71, 10.41] | 0.73 [-14.66, 16.12] |
| Pseudo-R2 | 0.86 | 0.75 | 0.79 | 0.83 |

<TFN>Multilevel models of changes for general cognitive performance, memory, executive functioning, and language using time in study as the timescale. In this sensitivity analysis, we excluded persons with dementia.