**Supplementary Table 1. Percentile scores for Modified Mini Mental State (3MS) examination scores stratified by age, education and gender, for Australian Whites (n=16,360).**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Females** | | | | | | | |  | **Males** | | | | | | | |
| **Age, years** | **70-74** | |  | **75-79** | |  | **80+** | |  | **70-74** | |  | **75+** | |  | **80+** | |
| **Education** | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |
| **n** | *3,133* | *1,942* |  | *1,624* | *852* |  | *1,042* | *435* |  | *2,440* | *1,930* |  | *1,160* | *706* |  | *652* | *444* |
| **Total 3MS** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 100 | 100 | 100 |  | 100 | 100 |  | 100 | 100 |  | 100 | 100 |  | 100 | 100 |  | 100 | 100 |
| 99 | 96 | 91 |  | 97 | 94 |  | 98 | 93 |  | 98 | 95 |  | 99 | 96 |  | 98 | 98 |
| 98 | 90 | 77 |  | 92 | 84 |  | 95 | 88 |  | 95 | 87 |  | 96 | 91 |  | 96 | 94 |
| 97 | 90 | 62 |  | 84 | 73 |  | 89 | 78 |  | 89 | 76 |  | 92 | 81 |  | 93 | 87 |
| 96 | 69 | 48 |  | 75 | 61 |  | 82 | 67 |  | 80 | 63 |  | 86 | 71 |  | 89 | 79 |
| 95 | 58 | 37 |  | 65 | 49 |  | 74 | 57 |  | 71 | 51 |  | 78 | 60 |  | 83 | 70 |
| 94 | 46 | 28 |  | 54 | 39 |  | 65 | 48 |  | 62 | 40 |  | 69 | 50 |  | 76 | 59 |
| 93 | 37 | 20 |  | 44 | 31 |  | 57 | 39 |  | 53 | 31 |  | 59 | 42 |  | 67 | 50 |
| 92 | 30 | 15 |  | 37 | 24 |  | 50 | 30 |  | 45 | 23 |  | 50 | 33 |  | 60 | 42 |
| 91 | 23 | 11 |  | 29 | 18 |  | 42 | 24 |  | 36 | 19 |  | 42 | 26 |  | 52 | 36 |
| 90 | 18 | 7 |  | 23 | 14 |  | 35 | 20 |  | 30 | 13 |  | 36 | 19 |  | 45 | 30 |
| 89 | 14 | 5 |  | 18 | 11 |  | 27 | 16 |  | 24 | 9 |  | 29 | 15 |  | 37 | 25 |
| 88 | 11 | 4 |  | 14 | 8 |  | 23 | 12 |  | 19 | 7 |  | 25 | 11 |  | 33 | 21 |
| 87 | 8 | 2 |  | 11 | 6 |  | 19 | 10 |  | 15 | 5 |  | 20 | 8 |  | 27 | 15 |
| 86 | 6 | 1 |  | 8 | 4 |  | 15 | 7 |  | 12 | 3 |  | 16 | 6 |  | 22 | 11 |
| 85 | 5 | 1 |  | 6 | 4 |  | 11 | 5 |  | 9 | 3 |  | 13 | 4 |  | 17 | 8 |
| 84 | 3 | <1 |  | 5 | 3 |  | 9 | 5 |  | 7 | 2 |  | 10 | 3 |  | 13 | 5 |
| 83 | 2 | <1 |  | 4 | 2 |  | 7 | 4 |  | 5 | 1 |  | 8 | 2 |  | 9 | 4 |
| 82 | 1 | <1 |  | 3 | 1 |  | 6 | 3 |  | 3 | 1 |  | 6 | 2 |  | 7 | 2 |
| 81 | <1 | <1 |  | 2 | <1 |  | 4 | 1 |  | 2 | <1 |  | 4 | 1 |  | 4 | 1 |
| 80 | <1 | <1 |  | 1 | <1 |  | 3 | 1 |  | 1 | <1 |  | 2 | <1 |  | 3 | 1 |
| 79 | <1 | <1 |  | 1 | <1 |  | 1 |  |  | <1 | <1 |  | 1 | <1 |  | 1 | <1 |
| 78 | <1 | <1 |  | <1 |  |  | <1 | <1 |  | <1 | <1 |  | <1 | <1 |  | <1 | <1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Blank cells indicate no observations

**Supplementary Table 2. Percentile scores for Modified Mini Mental State (3MS) examination scores stratified by age, education and gender, for U.S Whites (n=1088).**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Females** | | | | |  | **Males** | | | | |
| **Age, years** | **70-74** | |  | **75+** | |  | **70-74** | |  | **75+** | |
| **Education, years** | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |
| ***n*** | *56* | *273* |  | *88* | *324* |  | *29* | *132* |  | *31* | *155* |
| **3MS Score** |  |  |  |  |  |  |  |  |  |  |  |
| 100 | 100 | 100 |  | 100 | 100 |  | 100 | 100 |  |  | 100 |
| 99 | 94 | 84 |  | 95 | 87 |  | 96 | 92 |  | 100 | 94 |
| 98 | 80 | 66 |  | 87 | 71 |  | 89 | 72 |  | 90 | 79 |
| 97 | 69 | 52 |  | 77 | 56 |  | 82 | 59 |  | 83 | 72 |
| 96 | 60 | 32 |  | 64 | 46 |  | 72 | 46 |  | 77 | 60 |
| 95 | 53 | 23 |  | 51 | 34 |  | 62 | 34 |  | 74 | 52 |
| 94 | 33 | 17 |  | 38 | 26 |  | 58 | 28 |  | 67 | 42 |
| 93 | 30 | 14 |  | 32 | 20 |  | 51 | 24 |  | 58 | 36 |
| 92 | 21 | 10 |  | 27 | 16 |  | 34 | 16 |  | 54 | 29 |
| 91 | 19 | 8 |  | 15 | 12 |  | 20 | 12 |  | 45 | 25 |
| 90 | 16 | 6 |  | 11 | 8 |  |  | 8 |  | 38 | 20 |
| 89 | 14 | 3 |  | 10 | 6 |  |  |  |  |  | 15 |
| 88 | 10 | 3 |  | 9 | 5 |  |  |  |  | 32 | 11 |
| 87 | 7 | 2 |  | 7 | 4 |  |  | 5 |  | 19 | 9 |
| 86 |  |  |  |  | 3 |  | 17 | 3 |  | 12 | 4 |
| 85 | 3 | 1 |  | 6 |  |  | 10 | 3 |  | 6 | 3 |
| 84 |  |  |  | 5 | 2 |  | 6 |  |  | 3 | 2 |
| 83 |  |  |  | 4 | 1 |  |  | 1 |  |  | 1 |
| 82 |  |  |  |  | 1 |  |  |  |  |  | 1 |
| 81 |  | 1 |  | 3 | <1 |  | 3 |  |  |  | <1 |
| 80 |  |  |  |  | <1 |  |  |  |  |  |  |
| 79 |  | <1 |  | 2 | <1 |  |  |  |  |  |  |
| 78 |  |  |  | 1 |  |  |  |  |  |  |  |

Blank cells indicate no observations

**Supplementary Table 3. Percentile scores for Modified Mini Mental State (3MS) examination scores stratified by age, education and gender, for U.S African Americans (n=895).**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Females** | | | | |  | **Males** | | | | |
| **Age, years** | **65-69** | |  | **70+** | |  | **65-69** | |  | **70+** | |
| **Education, years** | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |
| ***n*** | *64* | *183* |  | *106* | *240* |  | *54* | *101* |  | *61* | *86* |
| **3MS Score** |  |  |  |  |  |  |  |  |  |  |  |
| 100 | 100 | 100 |  | 100 | 100 |  |  | 100 |  | 100 |  |
| 99 | 98 | 95 |  |  | 97 |  | 100 | 97 |  |  | 100 |
| 98 | 95 | 86 |  | 98 | 92 |  | 98 | 89 |  | 98 | 95 |
| 97 | 90 | 78 |  | 95 | 85 |  | 96 | 82 |  | 95 | 90 |
| 96 | 89 | 68 |  | 91 | 76 |  | 92 | 74 |  | 91 | 84 |
| 95 | 79 | 55 |  | 83 | 69 |  | 88 | 64 |  | 90 | 77 |
| 94 | 70 | 46 |  | 75 | 59 |  | 77 | 53 |  | 83 | 66 |
| 93 | 62 | 38 |  | 70 | 48 |  | 59 | 44 |  | 77 | 54 |
| 92 | 56 | 30 |  | 64 | 40 |  | 46 | 29 |  | 70 | 45 |
| 91 | 51 | 22 |  | 59 | 34 |  | 38 | 25 |  | 65 | 36 |
| 90 | 42 | 19 |  | 54 | 27 |  | 33 | 17 |  | 60 | 32 |
| 89 | 28 | 14 |  | 44 | 24 |  | 31 | 14 |  | 52 | 27 |
| 88 | 18 | 7 |  | 34 | 20 |  | 25 | 10 |  | 44 | 19 |
| 87 | 14 | 4 |  | 31 | 16 |  | 22 | 9 |  | 40 | 12 |
| 86 | 12 |  |  | 29 | 14 |  | 16 | 7 |  | 36 | 10 |
| 85 | 10 | 3 |  | 22 | 12 |  | 12 |  |  | 32 | 8 |
| 84 | 9 | 2 |  | 19 | 8 |  |  | 5 |  | 22 | 6 |
| 83 | 6 | 1 |  | 16 | 6 |  |  | 3 |  | 16 |  |
| 82 | 4 |  |  | 14 | 4 |  | 11 |  |  | 13 | 4 |
| 81 | 3 |  |  | 11 | 2 |  | 7 | 2 |  | 11 | 2 |
| 80 |  |  |  | 8 | 1 |  | 3 | 1 |  | 4 |  |
| 79 |  |  |  | 4 | 1 |  | 1 |  |  | 3 |  |
| 78 | 1 | <1 |  | 2 | <1 |  |  |  |  |  |  |

**Supplementary Table 4. Percentile scores for Modified Mini Mental State (3MS) examination scores stratified by age, education and gender, for U.S Hispanic/Latinos (n=316).**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Females** | | | | |  | **Males** | | | | |
| **Age, years** | **65-69** | |  | **70+** | |  | **65-69** | |  | **70+** | |
| **Education, years** | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |  | **0-12** | **>12** |
| ***n*** | *47* | *37* |  | *79* | *32* |  | *28* | *23* |  | *37* | *33* |
| **3MS Score** |  |  |  |  |  |  |  |  |  |  |  |
| 100 | 100 | 100 |  | 100 | 100 |  | 100 |  |  |  |  |
| 99 | 97 | 94 |  | 98 | 96 |  |  | 100 |  |  | 100 |
| 98 | 95 | 81 |  | 97 |  |  | 96 | 91 |  | 100 | 93 |
| 97 | 93 | 75 |  |  | 90 |  | 85 | 78 |  | 97 | 78 |
| 96 | 89 | 62 |  | 92 | 84 |  | 82 | 65 |  | 89 | 69 |
| 95 |  | 48 |  | 87 | 75 |  |  | 47 |  | 83 | 63 |
| 94 | 82 | 32 |  | 82 | 56 |  | 71 | 43 |  | 75 | 54 |
| 93 | 74 | 24 |  | 77 | 40 |  | 64 | 39 |  | 67 | 42 |
| 92 | 65 |  |  | 72 |  |  |  |  |  | 59 | 39 |
| 91 | 55 | 21 |  | 70 | 28 |  | 57 |  |  | 56 | 30 |
| 90 | 42 | 16 |  | 62 |  |  | 46 | 17 |  | 54 | 21 |
| 89 | 40 | 10 |  | 50 | 21 |  | 35 | 13 |  | 51 | 18 |
| 88 | 36 | 8 |  | 45 | 18 |  | 32 |  |  | 48 | 12 |
| 87 | 27 | 5 |  | 36 | 15 |  | 21 | 8 |  | 43 |  |
| 86 | 19 |  |  | 32 |  |  |  |  |  | 37 |  |
| 85 | 14 |  |  |  | 12 |  | 17 | 4 |  | 35 | 9 |
| 84 | 8 |  |  | 25 |  |  |  |  |  |  |  |
| 83 | 6 |  |  | 22 | 9 |  | 14 |  |  | 27 | 6 |
| 82 |  |  |  | 18 |  |  | 7 |  |  | 21 |  |
| 81 |  |  |  | 11 | 6 |  |  |  |  | 18 |  |
| 80 |  |  |  | 6 | 3 |  | 3 |  |  |  |  |
| 79 |  |  |  | 5 |  |  |  |  |  | 13 |  |
| 78 |  | 2 |  | 2 |  |  |  |  |  | 8 | 3 |

**Supplementary Table 5: Exploratory factor analysis of the 15 items from the Modified Mini Mental State (3MS)**

**examination, for Australian Whites (n=16,360)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Factor** | **Eigenvalue** | **Difference** | **Proportion** | **Cumulative** |
|  |  |  |  |  |
| Factor 1 | 1.92 | 0.71 | 0.12 | 0.13 |
| Factor 2 | 1.20 | 0.13 | 0.080 | 0.21 |
| Factor 3 | 1.07 | 0.05 | 0.072 | 0.28 |
| Factor 4 | 1.02 | 0.02 | 0.068 | 0.35 |
| Factor 5 | 1.00 | 0.007 | 0.067 | 0.41 |
| Factor 6 | 0.99 | 0.01 | 0.066 | 0.48 |
| Factor 7 | 0.98 | 0.01 | 0.066 | 0.55 |
| Factor 8 | 0.97 | 0.02 | 0.065 | 0.61 |
| Factor 9 | 0.95 | 0.004 | 0.064 | 0.67 |
| Factor 10 | 0.95 | 0.04 | 0.063 | 0.74 |
| Factor 11 | 0.91 | 0.01 | 0.061 | 0.80 |
| Factor 12 | 0.90 | 0.08 | 0.060 | 0.86 |
| Factor 13 | 0.82 | 0.04 | 0.055 | 0.91 |
| Factor 14 | 0.78 | 0.25 | 0.052 | 0.97 |
| Factor 15 | 0.53 | - | 0.035 | 1.0 |
|  |  |  |  |  |

Likelihood-ratio test of independence against the saturated model: chi-square (105) = 8372.14, p<0.0001

**Supplementary Table 6: Four-factor solution to exploratory analysisa of the 15 items from the Modified Mini Mental State (3MS) examination, for Australian Whites (n=16,360)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Factor1**  **Verbal episodic memory** | **Factor2 Language & Executive Function** | **Factor3**  **Psychomotor & Working memory** | **Factor4**  **Orientation & Visuo-construction** | **Uniqueness** |
|  |  |  |  |  |  |
| First recall | **0.83** | 0.01 | -0.02 | -0.004 | 0.32 |
| Second recall | **0.82** | 0.05 | 0.07 | 0.009 | 0.32 |
|  |  |  |  |  |  |
| Naming | 0.02 | **0.49** | 0.26 | -0.21 | 0.72 |
| Read and obey | 0.01 | **0.47** | -0.11 | -0.10 | 0.74 |
| Repetition | 0.10 | **0.45** | 0.15 | 0.05 | 0.74 |
| Three-stage command | 0.01 | **0.43** | -0.22 | 0.06 | 0.75 |
| Similarities | 0.25 | **0.43** | 0.30 | 0.14 | 0.66 |
| Four-legged animals | 0.25 | *0.38****b*** | 0.12 | 0.01 | 0.78 |
|  |  |  |  |  |  |
| Writing | -0.05 | 0.11 | **0.69** | -0.05 | 0.52 |
| Mental reversal | 0.15 | -0.04 | **0.66** | 0.05 | 0.54 |
|  |  |  |  |  |  |
| Place & date of birth | 0.02 | -0.12 | -0.05 | **0.66** | 0.47 |
| Spatial Orientation | 0.03 | 0.29 | -0.04 | **0.49** | 0.73 |
| Copying pentagons | -0.10 | 0.18 | 0.22 | **0.43** | 0.75 |
|  |  |  |  |  |  |
| Registration | -0.10 | 0.02 | -0.10 | 0.21 | 0.88 |
| Temporal Orientation | 0.22 | 0.01 | 0.07 | 0.26 | 0.85 |
|  |  |  |  |  |  |
| **% Variance explained** | **12.4** | **8.0** | **7.2** | **6.8** | **34.4** |
|  |  |  |  |  |  |

**a**Numbers in bold represent factor loadings ≥ 0.40. ***a***Using an orthogonal rotation. **b**Four-legged animals loaded strongly on Factor 2 (0.38) although fell short of this cut-off.

**Supplementary Table 7: Four-factor solution to exploratory analysisa of the 15 items from the Modified Mini Mental State (3MS) examination, for Australian Whites (n=16,360)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Factor1**  **Verbal episodic memory** | **Factor2 Language & Executive Function** | **Factor3**  **Psychomotor & Working memory** | **Factor4**  **Orientation & Visuo-construction** | **Uniqueness** |
|  |  |  |  |  |  |
| First recall | **0.84** | 0.004 | -0.08 | -0.02 | 0.32 |
| Second recall | **0.82** | 0.04 | 0.003 | -0.01 | 0.32 |
|  |  |  |  |  |  |
| Naming | -0.05 | **0.41** | 0.24 | -0.24 | 0.72 |
| Read and obey | -0.03 | **0.51** | -0.16 | -0.13 | 0.74 |
| Repetition | 0.10 | **0.45** | 0.15 | 0.05 | 0.74 |
| Three-stage command | 0.03 | **0.48** | -0.26 | 0.02 | 0.75 |
| Similarities | 0.16 | **0.39** | 0.25 | 0.08 | 0.66 |
| Four-legged animals | 0.20 | *0.36****b*** | 0.11 | -0.04 | 0.78 |
|  |  |  |  |  |  |
| Writing | -0.14 | 0.04 | **0.70** | -0.07 | 0.52 |
| Mental reversal | 0.08 | -0.09 | **0.67** | 0.03 | 0.54 |
|  |  |  |  |  |  |
| Place & date of birth | -0.006 | -0.12 | -0.05 | **0.73** | 0.47 |
| Spatial Orientation | -0.03 | 0.26 | -0.09 | **0.42** | 0.73 |
| Copying pentagons | -0.15 | 0.08 | 0.23 | **0.39** | 0.75 |
|  |  |  |  |  |  |
| Registration | -0.12 | 0.27 | -0.13 | 0.15 | 0.88 |
| Temporal Orientation | 0.22 | -0.06 | 0.05 | 0.31 | 0.85 |
|  |  |  |  |  |  |
| **% Variance explained** | **12.7** | **8.0** | **7.2** | **6.8** | **34.4** |
|  |  |  |  |  |  |

**a**Numbers in bold represent factor loadings ≥ 0.40. ***a***Using an oblique rotation. **b**Four-legged animals loaded strongly on Factor 2 (0.36) although fell short of this cut-off.

**Supplementary Figure 1: The scree plot for the exploratory factor analysis of the 15 items on the 3MS in Australian white participants (n=16,360).** 3MS: Modified Mini Mental State examination.

