**Supplementary Table 1.** Matrix of correlation coefficients of all variables.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Mean** | **SD** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** |
| **1 Gender** | 0.50 | 0.50 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2 Age** | 46.02 | 24.28 | -0.11 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3 Education level** | 3.10 | 0.86 | -0.04 | -0.31 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4 Health condition** | 1.12 | 0.46 | 0.28 | 0.11 | -0.18 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |
| **5 Mental rotation ability** | 16.02 | 3.79 | -0.24 | -0.31 | 0.12 | -0.24 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |
| **6 Navigation strategy** | 1.20 | 0.51 | 0.00 | -0.04 | -0.10 | 0.42 | -0.37 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| **7 Electronic experience** | 3.46 | 1.84 | -0.13 | -0.49 | 0.57 | -0.37 | 0.28 | -0.09 | 1.00 |  |  |  |  |  |  |  |  |  |
| **8 Sense of direction** | 4.21 | 0.75 | -0.32 | 0.18 | 0.00 | -0.17 | -0.09 | -0.16 | 0.04 | 1.00 |  |  |  |  |  |  |  |  |
| **9 Indoor-outdoor route alignment** | 0.50 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |  |  |  |  |  |  |  |
| **10 Visual access** | 0.50 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |  |  |  |  |  |  |
| **11 Wayfinding time** | 114.74 | 96.77 | 0.10 | **0.66\*\*\*** | **-0.38\*\*\*** | **0.27\*\*\*** | **-0.40\*\*\*** | -0.01 | **-0.62\*\*\*** | 0.09 | 0.05 | -0.02 | 1.00 |  |  |  |  |  |
| **12 Total distance traveled** | 174.55 | 100.00 | 0.11 | **0.42\*\*\*** | **-0.31\*\*\*** | **0.17\*** | **-0.32\*\*\*** | -0.06 | **-0.45\*\*\*** | -0.01 | -0.06 | 0.03 | 0.84 | 1.00 |  |  |  |  |
| **13 Number of hesitation** | 7.70 | 7.54 | 0.14 | **0.71\*\*\*** | **-0.41\*\*\*** | **0.32\*\*\*** | **-0.35\*\*\*** | 0.00 | **-0.62\*\*\*** | 0.09 | 0.03 | 0.00 | 0.94 | 0.74 | 1.00 |  |  |  |
| **14 Number of turn errors** | 1.24 | 1.17 | 0.07 | **0.37\*\*\*** | **-0.27\*\*\*** | **0.16\*** | **-0.31\*\*\*** | -0.07 | **-0.43\*\*\*** | 0.00 | 0.04 | 0.01 | 0.78 | 0.90 | 0.68 | 1.00 |  |  |
| **15 Time of cognitive map drawing** | 61.03 | 44.84 | -0.05 | **0.30\*\*\*** | -0.14 | 0.05 | 0.05 | 0.06 | **-0.22\*\*** | 0.02 | 0.13 | -0.05 | 0.38 | 0.21 | 0.38 | 0.20 | 1.00 |  |
| **16 Accuracy of cognitive map drawing** | 10.34 | 2.62 | -0.11 | **-0.52\*\*\*** | **0.41\*\*\*** | **-0.18\*** | **0.25\*\*** | -0.01 | **0.54\*\*\*** | 0.09 | **-0.29\*\*\*** | **0.16\*** | -0.56 | -0.44 | -0.58 | -0.45 | -0.21 | 1.00 |

The variables gender, education level, health condition, navigation strategy, indoor-outdoor route alignment, and visual access were all nominal variables represented by numerical values in the correlation analysis. Specifically, in Gender, 0 and 1 represented Male and Female, respectively. In education level, 1, 2, 3, and 4 represented primary school and below, junior high school, senior high school, and undergraduate or associate degree, respectively. In health condition, 1, 2, and 3 represented non-disease, coronary heart disease, and others, respectively. In navigation strategy, 1, 2, and 3 represented egocentric, allocentric, and neutral, respectively. In indoor-outdoor route alignment, 0 and 1 represented 0° and 45°, respectively. In visual access, 0 and 1 represented low visual access and high visual access, respectively.

The significance levels were indicated as \*p<.05, \*\*p<.01, and \*\*\*p<.001.

**Supplementary Table 2. Matrix of correlation coefficients of all variables in older adults.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Mean** | **SD** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** |
| **1 Gender** | 0.50 | 0.50 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2 Age** | 70.00 | 4.42 | -0.28 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3 Education level** | 2.60 | 0.87 | -0.12 | 0.24 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4 Health condition** | 1.25 | 0.63 | 0.42 | -0.40 | -0.11 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |
| **5 Mental rotation ability** | 15.10 | 3.48 | -0.27 | -0.13 | -0.02 | -0.27 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |
| **6 Navigation strategy** | 1.20 | 0.51 | 0.15 | -0.03 | -0.17 | 0.60 | -0.29 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| **7 Electronic experience** | 2.18 | 1.23 | -0.34 | 0.26 | 0.34 | -0.35 | -0.02 | -0.30 | 1.00 |  |  |  |  |  |  |  |  |  |
| **8 Sense of direction** | 4.31 | 0.69 | -0.32 | 0.28 | 0.17 | -0.33 | 0.13 | -0.42 | 0.15 | 1.00 |  |  |  |  |  |  |  |  |
| **9 Indoor-outdoor route alignment** | 0.50 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |  |  |  |  |  |  |  |
| **10 Visual access** | 0.50 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |  |  |  |  |  |  |
| **11 Wayfinding time** | 183.10 | 93.61 | 0.18 | 0.16 | **0.28\*** | 0.19 | **-0.40\*\*\*** | 0.18 | -0.10 | -0.07 | 0.05 | -0.01 | 1.00 |  |  |  |  |  |
| **12 Total distance traveled** | 223.12 | 106.09 | 0.02 | 0.11 | 0.06 | 0.05 | -0.21 | 0.09 | -0.03 | -0.06 | -0.07 | 0.16 | 0.76 | 1.00 |  |  |  |  |
| **13 Number of hesitation** | 13.04 | 7.38 | **0.23\*** | 0.13 | **0.24\*** | **0.23\*** | **-0.37\*\*\*** | 0.13 | -0.14 | -0.09 | 0.01 | -0.01 | 0.93 | 0.71 | 1.00 |  |  |  |
| **14 Number of turn errors** | 1.81 | 1.24 | 0.01 | 0.03 | 0.13 | 0.05 | -0.16 | 0.06 | -0.01 | -0.11 | 0.07 | 0.11 | 0.63 | 0.84 | 0.57 | 1.00 |  |  |
| **15 Time of cognitive map drawing** | 76.70 | 53.43 | -0.19 | 0.10 | 0.10 | -0.07 | 0.18 | 0.07 | -0.17 | 0.01 | 0.07 | -0.13 | 0.25 | -0.05 | 0.25 | 0.03 | 1.00 |  |
| **16 Accuracy of cognitive map drawing** | 8.78 | 2.08 | 0.00 | -0.01 | 0.16 | 0.03 | 0.02 | -0.15 | 0.20 | 0.10 | -0.30 | 0.37 | -0.10 | -0.08 | -0.05 | -0.07 | 0.03 | 1.00 |

The variables gender, education level, health condition, navigation strategy, indoor-outdoor route alignment, and visual access were all nominal variables represented by numerical values in the correlation analysis. Specifically, in Gender, 0 and 1 represented Male and Female, respectively. In education level, 1, 2, 3, and 4 represented primary school and below, junior high school, senior high school, and undergraduate or associate degree, respectively. In health condition, 1, 2, and 3 represented non-disease, coronary heart disease, and others, respectively. In navigation strategy, 1, 2, and 3 represented egocentric, allocentric, and neutral, respectively. In indoor-outdoor route alignment, 0 and 1 represented 0° and 45°, respectively. In visual access, 0 and 1 represented low visual access and high visual access, respectively.

The significance levels were indicated as \*p<.05, \*\*p<.01, and \*\*\*p<.001.

**Supplementary Table 3. Matrix of correlation coefficients of all variables in younger adults.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Mean** | **SD** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **1 Gender** | 0.50 | 0.50 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2 Age** | 22.05 | 1.76 | -0.18 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3 Education level** | 3.60 | 0.49 | 0.00 | 0.79 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |
| **4 Mental rotation ability** | 16.95 | 3.88 | -0.26 | 0.13 | -0.04 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |
| **5 Navigation strategy** | 1.20 | 0.51 | -0.15 | -0.15 | -0.20 | -0.48 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| **6 Electronic experience** | 4.73 | 1.41 | -0.04 | 0.46 | 0.35 | 0.19 | 0.02 | 1.00 |  |  |  |  |  |  |  |  |  |
| **7 Sense of direction** | 4.12 | 0.80 | -0.31 | -0.01 | 0.03 | -0.11 | 0.09 | 0.28 | 1.00 |  |  |  |  |  |  |  |  |
| **8 Indoor-outdoor route alignment** | 0.50 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |  |  |  |  |  |  |  |
| **9 Visual access** | 0.50 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |  |  |  |  |  |  |
| **10 Wayfinding time** | 46.38 | 24.88 | 0.19 | **-0.27\*** | -0.14 | -0.13 | -0.17 | **-0.29\*\*** | -0.05 | 0.08 | -0.10 | 1.00 |  |  |  |  |  |
| **11 Total distance traveled** | 125.98 | 63.99 | **0.25\*** | **-0.32\*\*\*** | -0.17 | -0.17 | -0.20 | **-0.26\*** | -0.15 | -0.03 | -0.14 | 0.79 | 1.00 |  |  |  |  |
| **12 Number of hesitation** | 2.35 | 1.46 | **0.23\*** | -0.09 | -0.13 | 0.00 | -0.15 | -0.06 | 0.02 | 0.07 | 0.02 | 0.76 | 0.52 | 1.00 |  |  |  |
| **13 Number of turn errors** | 0.68 | 0.75 | 0.15 | **-0.33\*\*** | -0.13 | -0.19 | **-0.23\*** | **-0.29\*\*** | -0.07 | 0.03 | -0.13 | 0.71 | 0.87 | 0.48 | 1.00 |  |  |
| **14 Time of cognitive map drawing** | 45.35 | 26.35 | 0.12 | -0.02 | 0.01 | 0.19 | 0.07 | 0.17 | -0.10 | 0.21 | 0.05 | 0.16 | 0.13 | 0.14 | 0.06 | 1.00 |  |
| **15 Accuracy of cognitive map drawing** | 11.91 | 2.13 | **-0.23\*** | 0.05 | -0.04 | 0.11 | 0.12 | **0.26\*** | **0.32\*** | **-0.45\*\*\*** | 0.04 | -0.24 | -0.26 | -0.26 | -0.34 | -0.12 | 1.00 |

The variables gender, education level, health condition, navigation strategy, indoor-outdoor route alignment, and visual access were all nominal variables represented by numerical values in the correlation analysis. Specifically, in Gender, 0 and 1 represented Male and Female, respectively. In education level, 1, 2, 3, and 4 represented primary school and below, junior high school, senior high school, and undergraduate or associate degree, respectively. In navigation strategy, 1, 2, and 3 represented egocentric, allocentric, and neutral, respectively. In indoor-outdoor route alignment, 0 and 1 represented 0° and 45°, respectively. In visual access, 0 and 1 represented low visual access and high visual access, respectively.

Among younger adults, the health condition was non-disease. Due to its standard deviation of 0, it was not included in the relevant analysis.

The significance levels were indicated as \*p<.05, \*\*p<.01, and \*\*\*p<.001.