For social network,first three items of **Older Americans Resources and Services (OARS)** - Social Resources Scale were taken from the Brain Health Now dataset. The first item was: how many people do you know well enough to visit within their homes? (Response options: 5 or more; 3-4; 1-2; and none. The second item was: about how many times in the past week did you talk to someone (friends, relatives or others) on the telephone, or by text message, or internet? The third item was: how many times during the past week did you spend some time with someone who does not live with you, that is you went to see them or they came to visit you or you went out to do things together? The response options for the second and the third item were: one or more times in a day; almost every day (2 to 6 times a week); once a week; and less than once a week.

**In Perceived Deficits Questionnaire (PDQ),** there are 20 items with five response options: never; rarely; sometimes; often; and almost always. The specific items are as follows: 1. Lose your train of thought when speaking? 2. Have difficulty remembering the names of people, even the ones you have met several times? 3. Forget what you came into the room for? 4. Have trouble getting things organized? 5. Have trouble concentrating on what people are saying during a conversation? 6. Forget if you had already done something? 7. Miss appointments and meetings you had scheduled? 8. Have difficulty planning what to do in the day? 9. Have trouble concentrating on things like watching a television program or reading a book? 10. Forget what you did the night before? 11. Forget the date unless you looked it up? 12. Have trouble getting started, even if you had a lot of things to do? 13. Find your mind drifting? 14. Forget what you talked about after a telephone conversation? 15. Forgot to do things like turn off the stove or turn on your alarm clock? 16. Feel your mind went totally blank? 17. Have trouble holding phone numbers in your head even for a few seconds? 18. Forget what you did last weekend? 19. Forget to take your medication? 20. Have trouble making decisions?

Ten items from **Stanford Presenteeism Scale (SPS)** were used.The items included: 1. Were you able to finish hard tasks? 2. Did you find your attention wandering? 3.Were you able to focus on achieving work goals? 4. Did you feel energetic enough to work? 5.Were the stresses of your job hard to handle? 6.Did you feel hopeless about finishing your work? 7.Were you able to focus on finding a solution when unexpected problems arose in your work? 8.Did you need to take breaks from your work? 9.Were you able to work with other people on shared tasks? 10.Were you tired because you lost sleep? The response options are on a 5-point ordinal scale: always; frequently; about half the time; occasionally; and never.

**Supplementary Table 1.** Correlation coefficients between all indicators of cognitive reserve

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| **1** | 1 | 0.46a | 0.15 | 0.11 | 0.2 | 0.12 | 0.29 | -0.08 | 0.21 | 0.12 | 0.07 | 0.18 |
| 747 | 717b | 728 | 727 | 723 | 728 | 723 | 730 | 747 | 746 | 744 | 743 |
| **2** |  | 1 | 0.14 | 0.03 | 0.11 | 0.16 | 0.29 | -0.05 | 0.17 | 0.13 | 0.09 | 0.09 |
| 741 | 708 | 707 | 704 | 708 | 706 | 709 | 725 | 724 | 722 | 739 |
| **3** |  |  | 1 | 0.19 | 0.41 | 0.13 | 0.17 | 0.01 | 0.15 | 0.04 | 0.13 | -0.01 |
| 730 | 726 | 724 | 726 | 722 | 729 | 730 | 729 | 727 | 726 |
| **4** |  |  |  | 1 | 0.42 | 0.12 | 0.11 | 0.09 | 0.09 | 0.008 | 0.1 | 0.01 |
| 729 | 722 | 726 | 721 | 728 | 725 | 728 | 726 | 725 |
| **5** |  |  |  |  | 1 | 0.23 | 0.23 | 0.08 | 0.12 | 0.02 | 0.12 | 0.007 |
| 725 | 722 | 717 | 724 | 725 | 724 | 722 | 721 |
| **6** |  |  |  |  |  | 1 | 0.27 | 0.18 | 0.18 | 0.05 | 0.17 | 0.11 |
| 730 | 722 | 728 |  | 729 | 727 | 726 |
| **7** |  |  |  |  |  |  | 1 | 0.11 | 0.28 | 0.2 | 0.15 | 0.19 |
| 725 | 724 | 725 | 724 | 722 | 721 |
| **8** |  |  |  |  |  |  |  | 1 | 0.08 | 0.05 | 0.005 | -0.09 |
| 732 | 732 | 731 | 729 | 728 |
| **9** |  |  |  |  |  |  |  |  | 1 | 0.48 | 0.45 | -0.04 |
| 755 | 754 | 752 | 751 |
| **10** |  |  |  |  |  |  |  |  |  | 1 | 0.5 | -0.03 |
| 754 | 752 | 767 |
| **11** |  |  |  |  |  |  |  |  |  |  | 1 | -0.01 |
| 752 | 748 |
| **12** |  |  |  |  |  |  |  |  |  |  |  | 1 |
|  | 767 |

1= Education; 2 = Work; 3 = Visual arts; 4 = Music; 5 = Performance arts; 6 = Sports; 7 = Travel; 8 = Games; 9 = OARS item 1; 10 = OARS item 2; 11= OARS item 3; and 12 = Number of languages spoken

aPolychoric correlation coefficient

bSample size