Details of assessment measures

Processing Speed

Tasks for the processing speed construct were taken from the Virginia Cognitive Aging Project (Salthouse, 2004, 2010; Salthouse & Ferrer-Caja, 2003).

Digit-symbol coding (paper and pencil). Participants wrote the corresponding symbol for each digit using a coding table for reference. Primary measure was total correct.

Letter comparison and Pattern comparison (paper and pencil). Participants determined whether a pair of patterns or letter combinations were the same or different. Primary measures were mean of total correct on each task.

Working Memory

Visual short-term memory (E-prime). An array of four objects briefly appeared on the screen. After a delay, an object appeared and participants had to decide whether this stimulus was in the original array. The experiment consisted of three blocks with targets varying in color, shape, (practice blocks) and conjunctions of color and shape (task block), respectively. Visual short-term memory was measured by the composite of RT and accuracy (i.e., average of normalized scores of RT and accuracy; RT was reverse coded to be consistent to accuracy, therefore higher score represents better performance) on the conjunction condition.

N-back (E-prime). Participants viewed a sequence of centrally presented letters. For each letter, participants were instructed to determine if the letter was the same as the previous letter (practice block), or the same as the letter two back (task block). N-back memory was measured by the composite of RT and accuracy (i.e., average of normalized scores of RT and accuracy; RT was

reverse coded to be consistent to accuracy, therefore higher score represents better performance) on the two-back condition.

Spatial working memory (E-prime). On each trial, a configuration of four black dots was presented on the screen. After a brief delay, one dot appeared and participants were instructed to determine if the dot was in the same position as one of the black dots presented earlier in that trial. Spatial working memory was measured by the composite of RT and accuracy (i.e., average of normalized scores of reserved RT and accuracy, therefore higher score represents better performance).

Executive Control

Color Stroop (E-prime). Participants viewed a sequence of words and were asked to determine the color of the word. Three trial types were randomly presented: congruent (e.g., word "red" in red ink), neutral (e.g., word "dog" in red ink), or incongruent (e.g., word "red" in blue ink). The Stroop cost was calculated by contrasting the composite scores (i.e., average of normalized scores of reversed RT and accuracy) of congruent and incongruent conditions. Since the primary measure was the cost (congruent – incongruent), the lower score represents better performance.

Trail making (paper and pencil). Participants first connected numbers distributed across a sheet of paper by drawing a line between numbers in ascending order (trail A). Participants then connected numbers and letters in alternating and ascending order on a second sheet (trail B). The Trail cost was calculated by contrasting the response times of trail A and trail B conditions. Since the primary measure was the cost (Trail B-A), the lower score represents better performance.

Attentional blink (E-prime). Participants viewed sequences of rapidly presented black letters. In each sequence, a white letter appeared (location in sequence varied between trials) and probe followed the white letter at varying lags. During the critical condition, participants were asked to identify the white letter and the following probe. The Attentional Blink was calculated by contrasting the composite scores (i.e., average of normalized scores of reversed RT and accuracy) of the probe which appeared on lag 2 (probe appeared 2 items after the white letter) and lag 8 (probe appeared 8 items after the white letter). Since the primary measure was the cost (lag 8 – lag2), the lower score represents better performance.

Flanker task (fMRI task, E-prime). Participants responded to the direction of a central arrow that pointed in the same (congruent) or opposite direction (incongruent) as four other adjacent arrows (two on each side). The Flanker cost was calculated by contrasting the composite scores (i.e., average of normalized scores of reversed RT and accuracy) of congruent and incongruent conditions. Since the primary measure was the cost (congruent – incongruent), the lower score represents better performance.

Psychological Well-Being (NIH Tool Box)

For all measures of NIH Tool Box, the primary measures were age adjusted scores.

General life satisfaction (NIH Tool Box). This self-report measure assessed global feelings and attitudes about one's life.

Perceived stress (NIH Tool Box). This self-report measure assessed how unpredictable, uncontrollable, and overloaded participants find their lives.

Self-efficacy (NIH Tool Box). This self-report measure assessed participants' sense of global self-efficacy.

Olfaction and Standing balance (NIH Tool Box)

Odor identification (NIH Tool Box). This task assessed a person's ability to identify various odors. Participants used scratch-and-sniff cards and after scratching them one at a time, were asked to identify which of four pictures on the computer screen matched the odor they had just smelled.

Standing balance (NIH Tool Box). The Standing Balance Test was a measure developed to assess static standing balance. It involved the participant assuming and maintaining up to five poses for 50 seconds each. The sequence of poses were: eyes open on a solid surface, eyes closed on a solid surface, eyes open on a foam surface, eyes closed on a foam surface, eyes open in tandem stance on a solid surface. Postural sway was recorded for each pose using an accelerometer that the participant wore at waist level.