APPENDIX 1

*Intelligence measures*

The RAPM (Set II) comprises a matrix figure with three rows and three columns with the lower right hand entry missing. There are eight alternatives and participants must choose the one completing the 3 x 3 matrix figure. Three items from Set I were administered as examples. The score was the total number of correct responses and total administration time was 40 minutes (20 minutes for the 18 odd items and 20 minutes for the 18 even items).

DAT-AR is a series test based on abstract figures. 40 items are comprised in this test. Each item includes four figures following a given rule, and the participant must choose one of five possible alternatives. The score was the total number of correct responses and total administration time was 20 minutes (10 minutes for the 20 odd items + 10 for the 20 even items).

DAT-VR is a reasoning test comprising 40 items. A given sentence stated like an analogy must be completed. The first and last words from the sentence are missing, so a pair of words must be selected to complete the sentence from five possible alternative pairs of words. For instance: *….. is to water like eating is to ….. (A) Travelling-Driving, (B) Foot-Enemy, (C) Drinking-Bread, (D) Girl-Industry, (E) Drinking-Enemy*. Only one alternative is correct. The score was the total number of correct responses and total administration time was 20 minutes (10 minutes for the 20 odd items + 10 minutes for the even items).

DAT-SR is a mental folding test comprising 50 items. Each item is composed by an unfolded figure and four folded alternatives. The unfolded figure is shown at the left, whereas figures at the right depict folded versions. Participants are asked to choose one folded figure matching the unfolded figure at the left. The score was the total number of correct responses (well chosen folded figures) and total administration time was 20 minutes (10 minutes for the 25 odd items + 10 minutes for the 25 even items).

*Memory span measures*

The STM tasks were forward letter span (FLSPAN), forward digit span (FDSPAN), and corsi block tasks.

In the FLSPAN and FDSPAN tasks, single letters or digits (from 1 to 9) were presented on the computer screen at the rate of one letter or digit per 650 msec. Unlimited time was allowed to type in direct order the letters or digits presented. Set size of the experimental trials ranged from four to nine items (6 levels x 3 trials each = 18 trials total). Letters or digits were randomly grouped to form trials. Difficulty levels were randomly presented. The score was the number of accurately reproduced items (max = 117).

In the corsi block task nine boxes were shown on the computer screen. Three different configurations of boxes changing randomly on each trial were used to discourage perceptual strategies. One box at a time turned orange for 650 ms. each and the order in which they were sequentially highlighted must be remembered. There was unlimited time to respond. The sequences of the experimental trials increased from 4 to 9 (6 levels x 3 trials each = 18 trials total). Difficulty levels were randomly presented. The score was the number of highlighted boxes reproduced appropriately (max = 117).

The WMC tasks included: reading span, computation span, and dot matrix tasks.

In the reading span task participants verified which discrete sentences, presented in a sequence, did or did not make sense. Sentences were adapted from the Spanish standardization of the Daneman and Carpenter’s (1980) reading span test (Elosúa et al., 1996). Each display included a sentence and a to-be remembered capital letter. Sentences were 10 – 15 words long. As soon as the sentence-letter pair appeared, participants verified whether it did or did not make sense (it did half of the times) reading the capital letter for latter recall. Once the sentence was verified by pressing the answer buttons (yes/1-no/2) the next sentence-letter pair was presented. At the end of a given set, participants recalled, in their correct order in the alphabet, each letter from the set. Set sizes of the experimental trials ranged from 3 to 7 sentence/letter pairs per trial, for a total of 15 trials (5 levels x 3 trial = 15 trials total). Difficulty levels were randomly presented. The score was the number of correct answers in the verification and recalling tasks (max = 150).

The computation span task included a verification task and a recall task. 6 s were allowed to see a math equation (but no time limit was set to verify its accuracy) like (10/2) + 4 = 8, and the displayed solution, irrespective of its accuracy, must be remembered. After the final equation of the trial was displayed, the solutions from the equations must be reproduced in their correct serial order. Each math equation included two operations using digits from 1 to 10. The solutions were single-digit numbers.

The experimental trials ranged from three to seven equation/solutions (5 levels x 3 trials each = 15 trials total). Difficulty levels were randomly presented. The score was the number of correct answers in the verification and recalling tasks (max = 150).

In the dot matrix task a matrix equation must be verified and then a dot location displayed in a five x five grid must be retained. The matrix equation required adding or subtracting simple line drawings and it was presented for a maximum of 4.5 s. Once the response was delivered, the computer displayed the grid for 1.5 s. After a given sequence of equation-grid pairs, the grid spaces that contained dots must be recalled clicking with the mouse on an empty grid. The experimental trials increased in size from three to five equations and dots (3 levels x 3 trials = 9 trials total). Difficulty levels were randomly presented. The score was the number of correct answers in the verification and recalling tasks (max = 72).

*Processing speed measures*

In the PS tasks, participants were requested to verify, as quickly and accurately as possible, if a given test stimulus was presented previously. The participants pressed the computer key 1 for a “yes” answer and the computer key 0 for a “no” answer. In the verbal speed task, one letter was displayed for 650 ms. After this presentation, a fixation point appeared for 500 ms. Finally, the probe letter appeared in order to decide, as quickly and accurately as possible, if it had the same *meaning* as the one presented previously. Therefore, its physical appearance (uppercase or lowercase) must be ignored. Half of the trials requested a positive answer. There were 30 trials. The score was the mean reaction time (RT) for the correct answers only. In the numerical speed task, one single digit was displayed for 650 ms. After this presentation, a fixation point appeared for 500 ms. Finally, the probe digit appeared in order to decide, as quickly and accurately as possible, if it can be divided by the one presented previously. Half of the trials requested a positive answer. There were 30 trials. The score was the mean RT for the correct answers only. In the spatial speed task, one arrow was displayed for 650 ms. The arrow can be displayed in one of seven orientations (multiples of 45 degrees). After this presentation, a fixation point appeared for 500 ms. Finally, the probe arrow appeared in order to decide, as quickly and accurately as possible, if it had the same orientation of one presented previously. The arrows have distinguishable shapes in order to guarantee that their orientation is both memorized and evaluated. Half of the trials requested a positive answer. There were 30 trials. The score was the mean RT for the correct answers only.

Note that in these STM, WMC, and PS tasks, participants completed a set of three practice trials as many times as desired to ensure they understood the instructions.

The ATT tasks included verbal and quantitative versions of the flanker task (Eriksen and Eriksen, 1974) and a version of the Simon task (Simon, 1969).

The verbal flanker task required deciding, as fast as possible, if the letter presented in the center of a set of three letters was vowel (by pressing the computer key 1) or consonant (by pressing the computer key 0). The target letter (e.g. vowel) can be surrounded by compatible (e.g. vowel) or incompatible (e.g. consonant) letters.

The quantitative task required deciding, as fast as possible, if the digit presented in the center of a set of three digits was odd (by pressing the computer key 1) or even (by pressing the computer key 0). The target digit (e.g. odd) can be surrounded by compatible (e.g. odd) or incompatible (e.g. even) digits.

The spatial task required deciding if an arrow (horizontally depicted) pointed to the left (by pressing the computer key 1) or to the right (by pressing the computer key 0) of a fixation point. The target arrow pointing to a given direction (e.g. to the left) can be presented at the left (e.g. compatible) or at the right (e.g. incompatible) of the fixation point. In all these tasks, there were a total of 32 practice trials and 80 experimental trials. Half of the trials were compatible and they were randomly presented across the entire session. The mean reaction time for the incompatible trials was the dependent measure.

**References**

Daneman, M., & Carpenter, P. A. (1980). Individual-differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior, 19*, 450−466. http://dx.doi.org/10.1016/S0022-5371(80)90312-6

Elosúa, M. R., Gutiérrez, F., García-Madruga, J. A., Luque, J. L., & Gárate, M. (1996). Adaptación española del "Reading Span Test" de Daneman y Carpenter [Spanish standardization of the Reading Span Test]. *Psicothema, 8*, 383−395.

Eriksen, B. A., & Eriksen, C. W. (1974). Effects of noise letters upon the identification of target letter in a non-search task. *Perception & Psychophysics, 16*, 143−149. http://dx.doi.org/ 10.3758/BF03203267

Simon, J. R. (1969). Reactions toward the source of stimulation. *Journal of Experimental Psychology, 81*, 174−176. http://dx.doi.org/ 10.1037/h0027448