Supporting Online Material

Materials and Methods

Subject Attrition

The number of subjects that completed the study and the number that attrited are reported in Table 1. Subjects who attrited had significantly lower assessment task scores on the pretest for all measures except primary memory and secondary memory.

Training Tasks

Complex Span Training Tasks.

Adaptive Operation Span. For this task subjects had to remember letters in correct serial order and solve equations between letter presentations. Subjects were first presented with a equation. When they solved it, they clicked the mouse and were presented with a number. If the math equation equaled the number, subjects should have clicked a box labeled "True." Otherwise, they should have clicked a box marked "False." Subjects then saw a letter that was presented for 1 s. After a certain number of equations and letter presentations, a recall screen appeared, and subjects had to click the correct letters in the correct order that they were displayed. There were 15 letters that could be presented and letters never repeated within a trial.

For every session, subjects had to perform 8 sets of operation span trials. Each set was associated with a difficulty level and consisted of 3 trials. The number of equations and to-be-remembered letters was determined by the difficulty level. After subjects completed a set of trials, a feedback screen displayed percentages of correct answers for both the equations and letters. If subjects correctly answered 87.5% or more of the equations and remembered 87.5% or more of the letters, the difficulty level of the next set of trials increased by one. If subjects correctly answered fewer than 75% of the equations or remembered fewer than 75% of the

letters, the difficulty level of the next set of trials decreased by one. If subjects did not perform better than 87.5% on both tasks or performed worse than 75% on one of the tasks, the difficulty level of the next set stayed the same. For Level 1, subjects were presented with a 2-letter, a 3-letter, and a 4-letter trial. When subjects performed a Level 2 set they were presented with a 3-letter, a 4-letter, and a 5-letter trial. The difference between two adjacent levels was that, for the higher level, each trial consisted of one more equation and letter. The highest level was Level 12, in which subjects were presented with a 13-letter, a 14-letter, and a 15-letter trial. The order of the trials in a set was always randomized.

At the end of the eighth set, a screen was displayed that showed the next difficulty level the subject would have to perform. The experimenter wrote down this difficulty level and it was entered into the operation span program for the subject's next session. Thus, subjects would begin at the difficulty level in which the previous session had ended. The difficulty level on which a subject ended also determined the amount of bonus compensation. Subjects earned no bonus compensation if they ended on Level 1, $1 on Levels 2 and 3, $2 on Levels 4 and 5, $3 on Levels 6 and 7, $4 on Levels 8 and 9, $5 on Levels 10 and 11, and $6 on Level 12.

When we began running subjects we found that some of them spent a large amount of time rehearsing the letters during the presentation of the equations. Subjects had 8 s to click the screen before the math equation timed out and was counted as incorrect. We changed the program for every subject on their 6th session of training so that the equation timed out at 4 s instead of 8 s. We then noticed that subjects began to rehearse the letters during the presentation of the equation solution. Subjects had an indefinite amount of time before they selected whether the solution equaled the previously presented equation. Thus, we changed the program for all

subjects on their 7th training session so that they had only 2 s to indicate whether the solution equaled the equation.

Adaptive Symmetry Span. For this task subjects had to remember matrix locations in correct serial order and make symmetry judgments between matrix location presentations. Subjects were first presented with a large array of white and black squares and asked to determine whether the array was vertically symmetric. When the subject determined whether the array was symmetric, they clicked the screen to remove the array. On the next screen subjects clicked a box labeled "True" to indicate that the array was symmetric. Otherwise, they clicked a box marked "False." Subjects then saw a position on a 4X4 matrix highlighted in red that was presented for 650 ms. After a certain number of symmetry judgments and matrix location presentations, a recall screen appeared, and subjects had to click the correct matrix locations in the correct order that they were displayed. There were 16 matrix positions that could be presented and positions never repeated within a trial.

For every session, subjects had to perform 8 sets of symmetry span trials. Each set was associated with a difficulty level and consisted of 3 trials. The number of symmetry judgments and matrix positions were exactly the same per level as those for the adaptive operation span task. Subjects progressed to the next level in the same way as in the adaptive operation span task. The number of stimuli per level was exactly the same as the adaptive operation span task. Bonus compensation for the adaptive symmetry span task was identical to the adaptive operation span task.

After we made the math operation solution time changes to the adaptive operation span task, we began to notice subjects trying to rehearse the matrix locations during the symmetry judgment intervals. Therefore, starting on subjects' 10th session of training we changed the

array (for the symmetry judgment) maximum presentation time from 8 s to 4 s. We also changed the amount of time to make the symmetry judgment from an indefinite amount of time to 2 s.

Simple Span Training Tasks.

Adaptive Letter Span. This task was closely related to the adaptive operation span task in that subjects had to recall letters in their correct serial position. The major difference between the two tasks was that the adaptive letter span did not require subjects to make judgments about equations. Subjects were sequentially presented with a string of letters. The letters appeared on the screen for 1 s and the interstimulus interval (ISI) was 250 ms. Subjects performed 8 sets of 3 trials and each set was associated with a level. The number of letters that subjects had to remember in a given trial was the same as for the adaptive complex span tasks. If subjects recalled 87.5% or more of the letters in correct serial order, they progressed to the next level. If subjects recalled 75% or fewer of the letters in correct serial order, they went down a level. Otherwise the subject stayed on the same level. The bonus compensation rate was the same as that of the adaptive complex span tasks.

Adaptive Matrix Span. This task was closely related to the adaptive matrix span task, except subjects did not have to make symmetry judgments. Subjects were presented with a number of highlighted matrix locations and, when a recall screen was presented, had to select the correct matrix locations in the correct order that they saw them. Matrix locations were presented for 650 ms followed by a 250 ms ISI. Subjects completed 8 sets of 3 trials for every session of training. Each set was associated with a level and the number of stimuli and level progression was exactly the same as the adaptive letter span. The bonus compensation rate was the same as all the other adaptive span tasks.

Visual Search Training.

Adaptive Visual Search. For this task subjects were briefly presented with an array of letters in which there was one "F." The "F" was either facing towards the right (as it normally does) or to the left (ꟻ). Subjects had to indicate which "F" appeared in the array by pressing a key that was labeled with a left-facing or a right-facing "F" (the "Z" key and the comma key, respectively). For each trial, subjects were presented with a fixation dot in the center of the screen that lasted 500 ms. Then the array of letters was presented for 500 ms. After the array was presented, there was a mask that consisted of a 16X16 array of black squares (a black square over every potential letter location) and lasted 2500 ms. The size of the array depended on the level of the block of trials but ranged from a 2X2 array (1 target and 3 distractors) to a 16X16 array (1 target and 255 distractors). The distractors were *E*s, mirror-reversed *E*s, and/or inverted *T*s. Subjects made their responses during the mask presentation.

There were 24 trials in one block. There was a total of 16 blocks per experimental session. Each block was associated with a difficulty level (just like all the other training tasks). If subjects were accurate on 87.5% or more of the trials, the difficulty level of their next block of trials increased. If subjects were less than 75% accurate on a block, the level of their next block of trials decreased. Otherwise, the level of their next block of trials stayed the same. When subjects moved from an odd-numbered level to an even-numbered level, the distractors changed from homogenous to heterogeneous (i.e., from having all the distractors be the same to having the distractors be different). When subjects moved from an even-numbered level to an odd-numbered level, the distractors switched back to being homogenous, and the array size increased (e.g., from a 3X3 array to a 4X4 array). At the end of each block, subjects saw a percentage of the visual search trials answered correctly.

At the end of the sixteenth block of trials, a screen was displayed that showed the next difficulty level the subject would have to perform. The experimenter wrote down this difficulty level to be used as the first difficulty level for the subject's next training session. This difficulty level also corresponded to the amount of bonus compensation that the subject earned for that session. Subjects earned no bonus compensation if they ended on Levels 1 or 2, $2 on Levels 3 and 4, $4 on Levels 5 and 6, $6 on Levels 7 and 8, $8 on Levels 9 and 10, $10 on Levels 11 and 12, and $12 on Levels 13 and 14. Critically, subjects had the opportunity to make the same amount of bonus compensation per session for every training group.

Assessment Tasks. The order in which subjects received the assessment tasks is presented in Table 2.

Near Transfer Tasks.

Reading Span. For this task subjects were visually presented with a sentence and had to make a judgment about whether the sentence made sense. For instance, if the subject was presented with the sentence, "During winter you can get a room at the beach for a very low rate." the subject would click a button marked "True" because the sentence makes sense. However, if the subject was presented with the sentence, "Andy was stopped by the policeman because he crossed the yellow heaven." The subject would click a button marked "False" because the sentence did not make sense. After the sentence judgment, subjects were presented with one of 15 different four-letter words. Subjects were presented with a certain number of sentence judgments and words until a recall screen appeared. Then they had to click the words in the same order that they had been seen. Each word did not appear more than once per trial. Subjects received a total of 15 trials and the number of words per trial ranged from 3 words to 10 words. Subjects received 3 trials at list lengths of 3 and 4, 2 trials at list lengths 5, 6, and 7, and 1 trials at list lengths 8, 9,

and 10 subjects. The dependent variable of interest from this task was the total number of words subjects correctly remembered in their correct position.

Rotation Span. For this task subjects were presented with a letter (an F, G, J, or R) that was either facing in the correct direction or was mirror-reversed. The letter was rotated in one of eight different angles(0, 45, 90, 135, 180, 225, 270, and 315 degrees). Subjects had to indicate whether the letter, when rotated to the upright position, was facing the correct direction or was mirror-reversed. After the rotation judgment, the subject was presented with an arrow for 650 ms. The arrow was either short or long and was pointing in one of eight directions (up, down, left, right, and the four diagonals) for a total of 16 different arrows. The subject had to remember the arrows in the correct order that they were presented. After a certain number of rotation judgments and arrow presentations, a recall screen appeared, and subjects had to click on the arrows that they were presented with in the correct order that they saw them. Each arrow did not appear more than once per trial. Subjects received a total of 15 trials and the set size of each trial ranged from 3 to 10 arrows. The number of trials at each set size was identical to the reading span task. The dependent variable of interest from this task was the total number of arrows subjects correctly remembered in their correct position.

Word Span. The word span task was identical to the reading span task except subjects did not have to make sentence judgments. Subjects were presented with words and had to click the correct words in the correct order that they had been seen. The list lengths for the trials were identical to the reading span. The dependent variable of interest from this task was the total number of words subjects correctly remembered in their correct position.

Arrow Span. The arrow span task was identical to the rotation span task, except subjects did not have to make rotation judgments. Subjects were presented with arrows and had to click the

correct arrows in the correct order that they saw them. The list lengths of the trials were
identical to the rotation span. The dependent variable of interest from this task was the total
number of arrows subjects correctly remembered in their correct position.

Running Letter Span. In this task subjects were sequentially presented with a series of letters.
Once a recall screen appeared, subjects had to recall the most recent n number of items in correct
serial position. For instance, if subjects are told to remember the most recent 5 letters and they
were presented with G, X, T, J, Y, N, and P, subjects should respond with T, J, Y, N, and P in
that order to successfully complete that trial. Subjects were told the number of most recent
letters (set size) they had to remember before each trial and this number ranged from 3 to 9.
Subjects completed two trials per set size for a total of 14 trials. The order of trials was
randomized with the constraint that trials of the same set size occurred together. The letters were
presented for 300 ms with a 200 ms ISI.   The dependent variable of interest was the total
number of letters subjects correctly remembered in their correct position.

Running Spatial Span. This task was identical to the running letter span, except locations on a
4X4 matrix were the stimuli. The dependent variable of interest from this task was the total
number of matrix locations subjects correctly remembered in their correct position.

 Moderate Transfer Tasks.

Keep Track. For this task subjects were presented with 16 words one at a time from 6 categories
and were told to remember the most recent instances of a certain number of categories. For
example, if the subject was told to remember the most recent country and was presented with
France, Mile, England, Zinc, Russia, and Yellow, the subject should respond with Russia. There
were 15 trials in total and the number of categories per trial subjects had to remember the most
recent instance of (set size) was 2, 3, 4, 5, or 6. There were 3 trials per set size, and the order of

the trials was randomized. Before each trial subjects were told the categories for which they would have to recall the most recent instances. Words were presented for 1500 ms with a 250 ms ISI. There were a total of 6 categories (Colors, Metals, Animals, Relatives, Countries, and Distances), and there were 6 words per category for a total of 36 potential words. Once the words were presented, the subject was presented with the 6 instances of a category and told to select the most recent instance of that category. There were two versions of this task and the order in which subjects received the tasks (at pretest or posttest) was counterbalanced. The number of most recent category instances correctly recognized was the dependent variable of interest.

Visual Arrays. In this task, subjects were presented with an array of colored squares for a brief amount of time. After a short delay, another array appeared that was either identical to the previous array or an array in which one of the squares was a different color. Subjects had to indicate whether the second array was identical to the first.

Subjects sat roughly 45 cm from the monitor. From this distance, each square subtended .76° of visual angle and was 6 mm left to right and top to bottom. Although square locations were randomly assigned on a trial-by-trial basis, each square was presented at a distance of more than 2° (center to center) from the closest square. The locations of the squares were all at least 2° from fixation. Each square was also randomly assigned (with replacement) to one of seven colors using standard E-prime color values (RGB): White (255, 255, 255), black (0, 0, 0), red (255, 0, 0), yellow (255, 255, 0), green (0, 128, 0), blue (0, 0, 255), or purple (128, 0, 128). Squares were presented within a centered silver (192, 192, 192) background (19.1° X 14.3°). Arrays consisted of 4, 6, or 8 squares.

For each trial, subjects were first presented with a fixation screen that lasted 1000 ms. There was then a brief delay (100 ms) and, afterwards, the first array appeared for 250 ms. The interstimulus interval between the two arrays was 900 ms. The dependent variable was Cowan's *k* (Cowan et al. 2005).

Immediate Free Recall. For this task subjects were presented with 5 lists of 10 words and then had to type as many of the words as they could recall in any order. All the words were 4 letters long and contained only one syllable. The words were visually presented and each word was presented for 750 ms with a 250 ms ISI. There were two versions of this task; the order that subjects received these tasks was counterbalanced. Two dependent measures were obtained from this task: a measure of primary memory (PM) and a measure of secondary memory (SM). We used the Tulving and Colotla (1970) procedure to calculate these scores. Correctly recalled words were classified as either been retrieved from PM or SM based on the intratrial retention interval. The intratrial retention interval is the number of presentations and recalls of words occurring between the presentation and the recall of a given word. Words in which the intratrial retention interval was 7 or less were classified as being retrieved from PM, and words in which the intratrial retention interval was 8 or greater were classified as being retrieved from SM.

Far Transfer Tasks.

Raven's Advanced Progressive Matrices (RAPM; Raven, Raven, & Court, 1998). Subjects were presented with a 3X3 matrix of figures with the lower right part of the matrix missing. There was a certain logical pattern for each matrix. Subjects had to select a figure from one of 8 answer choices to complete the matrix in a way that was consistent with the matrix's pattern. Subjects received either the odd or even problems for their pretest and the other version for their

posttest (the order was counterbalanced). Subjects had 10 minutes to complete 18 problems.

The total number of correct problems was the dependent measure of interest.

Letter Sets (Ekstrom, French, Harman, & Dermen, 1976). Subjects were presented with 5 sets

of 4 letters. Four of the sets followed a certain pattern. Subjects had to select the letter set that

did not follow the pattern. Subjects had 7 minutes to complete 15 problems. There were two

versions of this task, and the order that subjects were presented with these two versions was

counterbalanced. The total number of correct problems was the dependent measure of interest.

Number Series (Thurstone, 1938). Subjects were presented with a series of numbers that were

arranged in a certain pattern and were asked to select the next number that would be consistent

with the pattern out of 5 answer choices. Subjects had 5 minutes to complete 10 problems. Five

problems were created by our lab for this task. There were two versions of this task, and the

order that subjects were presented with these two versions was counterbalanced. The total

number of correct problems was the dependent measure of interest.

Multitasks.

SynWin (Elsmore, 1994). Subjects completed two 5-minute blocks of the task (for a more

detailed description of this task see Redick et al., 2012). In one counterbalanced condition,

subjects completed SynWin sessions 1 and 2 during their pretest and sessions 3 and 4 during

their posttest. The order was reversed for the other counterbalanced condition. SynWin

performance was based on the average of each block. The subject's score was determined by a

formula that combines the points earned across all four sub-tasks, and this composite score was

used as the dependent variable.

ControlTower (CT). Subjects completed one 10-minute block of the task (for a more detailed

description of this task see Redick et al., 2012). There were two versions of this task, and the

order of the versions presented was counterbalanced. The subject's score on the primary task

was determined by the number of correct comparisons minus incorrect comparisons. The

subject's distractor score was the total number of distractors that the subject correctly answered.

Scales.

Implicit Theory of Intelligence Measure (Dweck, Chiu, & Hong, 1995). This measure consists

of three items. For each item, a statement was presented and subjects rated it on a 6-point Likert

scale the extent to which they agreed with the statement. High scores indicated that the subject

thought intelligence was malleable and low scores indicated that the subject thought intelligence

was static. This measure was only presented at pretest.

Need for Cognition (*Caccioppo, Petty, & Kao, 1984*). This measure consisted of 18 items. Each

item consisted of a statement that subjects rated on a 9-point Likert scale the extent to which they

agreed with the statement. Half of the items were reversed scored. This measure was only

presented at pretest.

Results

All statistical analyses were conducted with an alpha level of .05. When Mauchly's test

of sphericity was significant, we used the Huynh-Feldt correction (this will be denoted by the

non-integer degrees of freedom for the F-tests).

Training Tasks

There were many different dependent measures examined for the training tasks (highest

level for each training session, the level subjects ended on for each session, and the mean level

for every session). All these measures give the same results, so we report only the statistics for

the mean level of performance for each of the training tasks. We conducted 5 Repeated Measures

ANOVAs for each of the training tasks, and all main effects of session were significant at the .05 level (see Table 3 for the statistics).

To obtain the standardized scores (presented in Figure 3 of the paper), we first subtracted the average difficulty level of the first session of training from each subjects' performance for all sessions. Thus, the average performance for the first session was zero, and the average for every subsequent session was positive. We then divided each subjects' performance on every session by the standard deviation of all of the scores for that task.

Assessment Tasks

The means and SDs are reported in Table 4 and the results of the ANOVAs are reported in Table 5. To determine the simple effects for our results in the 3X2 ANOVAs we conducted two sets of 2X2 ANOVAs. One set compared the complex span training group to the visual search training group (Table 6), and the other set compared the simple span training group to the visual search training group (Table 7).

Table 1.

Subject Attrition Numbers

	Complex Span	**Simple Span**	**Visual Search**
Dropped Out of Study	7	13	12
Completed Study	21	17	17

Table 2.

Task Order for the Pretest and Posttest Sessions

Task Order	Task
1	Raven's Advanced Progressive Matrices
2	Arrow Span
3	Word Span
4	Visual Arrays
5	SynWin
6	Letter Sets
7	Number Series
8	Control Tower
9	Reading Span
10	KeepTrack
11	Running Letter Span
12	Rotation Span
13	Running Spatial Span
14	Immediate Free Recall
15	For Pretest – Need for Cognition Scale and Dweck Scale/ For Posttest – Post-Experimental Questionnaire

Table 3.

ANOVA Statistics for all Training Tasks

Training Task	Effect of Session		
	F	**df**	n_p^2
Operation Span	24.720	(9.885, 197.704)	.553
Symmetry Span	22.189	(2.897, 57.940)	.526
Letter Span	30.010	(4.096, 61.439)	.667
Arrow Span	20.369	(7.621, 258.246)	.647
Visual Search	27.506	(5.144, 77.164)	.647

Table 4.

Means and Standard Deviations for all Assessment Tasks

Task	Complex Span		Simple Span		Visual Search	
	Pre	Post	Pre	Post	Pre	Post
Rotation Span	23.762	34.905	18.824	18.647	19.941	18.059
	(1.934)	(2.431)	(2.153)	(2.702)	(2.153)	(2.702)
Reading Span	46.381	62.476	41.824	47.176	40.824	41.059
	(3.384)	(4.252)	(3.762)	(4.726)	(3.762)	(4.726)
Arrow Span	34.000	41.619	30.412	38.765	29.235	34.059
	(1.862)	(1.835)	(2.070)	(2.040)	(2.070)	(2.040)
Word Span	59.286	72.476	55.118	66.647	51.471	60.059
	(1.997)	(2.604)	(2.220)	(2.894)	(2.220)	(2.894)
Running Letter Span	34.571	43.333	32.235	43.471	32.235	32.353
	(2.315)	(3.097)	(2.573)	(3.442)	(2.573)	(3.442)
Running Matrix Span	34.095	47.000	31.647	42.882	31.471	32.412
	(2.169)	(2.839)	(2.410)	(3.155)	(2.410)	(3.155)
Keep Track	40.143	42.952	36.941	39.588	38.118	34.529
	(1.708)	(1.594)	(1.899)	(1.772)	(1.899)	(1.772)
Primary Memory	13.524	12.048	13.000	12.059	12.294	12.588
	(0.760)	(0.851)	(0.845)	(0.945)	(0.845)	(0.945)
Secondary Memory	13.429	15.857	9.765	13.588	11.882	10.706
	(1.109)	(1.365)	(1.233)	(1.517)	(1.233)	(1.517)
Visual Arrays[1]	4.559	4.184	4.180	3.886	3.713	3.517
	(0.198)	(0.236)	(0.220)	(0.262)	(0.227)	(0.270)
RAPM	10.762	10.762	10.529	10.706	10.412	9.824
	(0.660)	(0.711)	(0.734)	(0.790)	(0.734)	(0.790)

Letter Sets	11.857	11.619	12.882	11.412	11.118	10.412
	(1.123)	(0.559)	(1.248)	(0.621)	(1.248)	(0.621)
Number Series	7.330	7.524	7.118	6.588	7.118	7.529
	(0.388)	(0.502)	(0.431)	(0.558)	(0.431)	(0.558)
CT Primary Score[2]	24.429	31.683	25.083	34.167	27.375	30.167
	(1.972)	(2.369)	(2.259)	(2.714)	(2.259)	(2.714)
CT Distract Score[2]	26.810	26.286	26.063	24.938	26.250	26.500
	(0.408)	(0.580)	(0.468)	(0.664)	(0.468)	(0.664)
SynWin[3]	668.024	679.571	619.618	651.471	542.088	602.235
	(41.427)	(45.245)	(46.044)	(50.287)	(46.044)	(50.287)

[1]Visual Arrays crashed for one subject in the Visual Search condition so the data here are presented for 54 subjects.

[2]Control Tower crashed for one subject in the Visual Search condition so the data here are presented for 54 subjects.

[3]During the pretest sessions for 3 subjects (2 in the complex span condition and 1 in the simple span) and during the posttest session for one subject (visual search condition), one of the SynWin sessions crashed. For these subjects, their one SynWin session score is treated as the dependent measure instead of the average between the two scores.

Table 5.

ANOVA Statistics for the 3X2 Mixed ANOVA with all three groups

Task	Group			Session			Group by Session		
	F	*p*	n_p^2	F	*p*	n_p^2	F	*p*	n_p^2
Rotation Span	**8.704**	**0.001**	**0.251**	**6.316**	**0.015**	**0.108**	**12.322**	**0.001**	**0.322**
Reading Span	**4.109**	**0.022**	**0.136**	**8.834**	**0.004**	**0.145**	**3.911**	**0.026**	**0.131**
Arrow Span	**3.187**	**0.049**	**0.109**	**42.451**	**0.001**	**0.449**	0.971	0.386	0.036
Word Span	**5.467**	**0.007**	**0.174**	**67.447**	**0.001**	**0.565**	1.009	0.372	0.037
Running Letter Span	1.957	0.152	0.070	**15.315**	**0.001**	**0.228**	**3.673**	**0.032**	**0.124**
Running Matrix Span	**3.303**	**0.045**	**0.113**	**33.847**	**0.001**	**0.394**	**6.687**	**0.003**	**0.205**
Keep Track	3.066	0.055	0.105	0.382	0.539	0.007	**4.254**	**0.019**	**0.141**
Primary Memory	0.066	0.936	0.003	1.577	0.215	0.029	0.873	0.424	0.032
Secondary Memory	2.486	0.093	0.087	**6.283**	**0.015**	**0.108**	**4.602**	**0.014**	**0.150**
Visual Arrays[1]	**3.684**	**0.032**	**0.126**	3.829	0.056	0.070	0.126	0.882	0.005
RAPM	0.306	0.738	0.012	0.083	0.775	0.002	0.222	0.802	0.008
Letter Sets	0.886	0.418	0.033	1.303	0.259	0.024	0.265	0.768	0.010
Number Series	0.620	0.542	0.023	0.005	0.942	0.001	0.696	0.503	0.026
CT Primary Score[2]	0.135	0.874	0.005	**31.930**	**0.001**	**0.390**	2.551	0.088	0.093
CT Distract Score[2]	1.651	0.202	0.062	1.417	0.240	0.028	0.951	0.393	0.037
SynWin[3]	1.509	0.231	0.055	2.264	0.138	0.042	0.388	0.681	0.015

Effects significant at the .05 level are bolded.

[1]Visual Arrays crashed for one subject in the Visual Search condition so the data here are presented for 54 subjects.

[2]Control Tower crashed for one subject in the Visual Search condition so the data here are presented for 54 subjects.

[3]During the pretest sessions for 3 subjects (2 in the complex span condition and 1 in the simple span) and during the posttest session for one subject (visual search condition), one of the SynWin sessions crashed. For these subjects, their one SynWin session score is treated as the dependent measure instead of the average between the two scores.

Table 6.

ANOVA Statistics for the 2X2 Mixed ANOVA Comparing the Complex Span Training Group to the Visual Search Training Group

Task	Group			Session			Group by Session		
	F	*p*	n_p^2	F	*p*	n_p^2	F	*p*	n_p^2
Rotation Span	**10.950**	**0.002**	**0.233**	**8.216**	**0.007**	**0.186**	**16.253**	**0.001**	**0.311**
Reading Span	**7.200**	**0.011**	**0.167**	**7.651**	**0.009**	**0.175**	**7.216**	**0.011**	**0.167**
Arrow Span	**5.722**	**0.022**	**0.137**	**27.337**	**0.001**	**0.432**	1.380	0.248	0.037
Word Span	**10.447**	**0.003**	**0.225**	**58.689**	**0.001**	**0.620**	2.621	0.114	0.068
Running Letter Span	3.781	0.060	0.095	**7.224**	**0.011**	**0.167**	**6.846**	**0.013**	**0.160**
Running Matrix Span	**5.820**	**0.021**	**0.139**	**21.767**	**0.001**	**0.377**	**16.251**	**0.001**	**0.311**
Keep Track	**4.910**	**0.033**	**0.120**	0.088	0.768	0.002	**5.969**	**0.020**	**0.142**
Primary Memory	0.116	0.735	0.003	0.822	0.371	0.022	1.844	0.183	0.049
Secondary Memory	3.358	0.075	0.085	0.733	0.398	0.020	**6.074**	**0.019**	**0.144**
Visual Arrays[1]	**6.892**	**0.013**	**0.165**	2.832	0.101	0.075	0.278	0.601	0.008
RAPM	0.526	0.473	0.014	0.395	0.534	0.011	0.395	0.534	0.011
Letter Sets	2.587	0.116	0.067	0.994	0.326	0.027	0.244	0.624	0.007
Number Series	0.043	0.837	0.001	0.559	0.459	0.015	0.076	0.785	0.002
CT Primary Score[2]	0.059	0.810	0.002	**13.913**	**0.001**	**0.284**	2.745	0.106	0.073
CT Distract Score[2]	0.086	0.771	0.002	0.120	0.731	0.003	0.960	0.334	0.027
SynWin[3]	3.066	0.088	0.078	1.621	0.211	0.043	0.745	0.394	0.020

Effects significant at the .05 level are bolded.

[1]Visual Arrays crashed for one subject in the Visual Search condition so the data here are presented for 37 subjects.

[2]Control Tower crashed for one subject in the Visual Search condition so the data here are presented for 37 subjects.

[3]During the pretest sessions for 3 subjects (2 in the complex span condition and 1 in the simple span) and during the posttest session for one subject (visual search condition), one of the SynWin sessions crashed. For these subjects, their one SynWin session score is treated as the dependent measure instead of the average between the two scores.

Table 7.

ANOVA Statistics for the 2X2 Mixed ANOVA Comparing the Simple Span Training Group to the Visual Search Training Group

Task	Group			Session			Group by Session		
	F	*p*	n_p^2	F	*p*	n_p^2	F	*p*	n_p^2
Rotation Span	0.007	0.932	0.001	0.512	0.479	0.016	0.352	0.557	0.011
Reading Span	0.424	0.519	0.013	0.652	0.425	0.020	0.547	0.465	0.017
Arrow Span	1.173	0.287	0.035	**22.832**	**0.001**	**0.416**	1.638	0.210	0.049
Word Span	2.463	0.126	0.071	**31.776**	**0.001**	**0.498**	0.679	0.416	0.021
Running Letter Span	2.230	0.145	0.065	**5.587**	**0.024**	**0.149**	**5.358**	**0.027**	**0.143**
Running Matrix Span	2.321	0.137	0.068	**10.133**	**0.003**	**0.240**	**7.242**	**0.011**	**0.185**
Keep Track	0.841	0.366	0.026	0.149	0.702	0.005	**6.536**	**0.016**	**0.170**
Primary Memory	0.007	0.934	0.001	0.223	0.640	0.007	0.813	0.374	0.025
Secondary Memory	0.073	0.789	0.002	2.261	0.142	0.066	**8.067**	**0.008**	**0.201**
Visual Arrays[1]	1.816	0.188	0.055	1.396	0.246	0.043	0.056	0.814	0.002
RAPM	0.278	0.602	0.009	0.091	0.765	0.003	0.313	0.580	0.010
Letter Sets	1.164	0.289	0.035	1.024	0.319	0.031	0.126	0.724	0.004
Number Series	0.635	0.431	0.019	0.019	0.892	0.001	1.203	0.281	0.036
CT Primary Score[2]	0.063	0.804	0.002	**15.313**	**0.001**	**0.338**	**4.299**	**0.047**	**0.125**
CT Distract Score[2]	1.771	0.193	0.056	0.745	0.395	0.024	1.839	0.185	0.058
SynWin[3]	0.799	0.378	0.024	2.168	0.151	0.063	0.205	0.654	0.006

Effects significant at the .05 level are bolded.

[1]Visual Arrays crashed for one subject in the Visual Search condition so the data here are presented for 33 subjects.

[2]Control Tower crashed for one subject in the Visual Search condition so the data here are presented for 33 subjects.

[3]During the pretest sessions for 3 subjects (2 in the complex span condition and 1 in the simple span) and during the posttest session for one subject (visual search condition), one of the SynWin sessions crashed. For these subjects, their one SynWin session score is treated as the dependent measure instead of the average between the two scores.

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