

Supplementary material

Table S1. Pearson correlation matrix of the Vienna Test System results, age, and education.

	Age	Education	The Vienna Test System				
			Time anticipation	Spatial anticipation	Visual orientation	Perceptual speed	Spatial working memory
<i>Demographics</i>							
Age	1	-.11	.08	-.29*	-.18	.05	-.07
Education	-.11	1	-.01	-.06	.10	-.03	.15
<i>The Vienna Test System</i>							
Time anticipation	.08	-.07	1	.10	-.03	.10	.16
Spatial anticipation	-.29*	-.06	.10	1	.02	-.22	-.21
Visual orientation	-.18	.10	-.03	.02	1	-.08	-.17
Perceptual speed	.46	.03	.10	-.22	-.08	1	.25*
Spatial working memory	-.07	.15	.16	-.21	-.17	.25*	1

Note: Education, 1 (*n* = 0) = No school diploma; 2 (*n* = 1) = Compulsory education; 3 (*n* = 10) = Middle school diploma; 4 (*n* = 14) = high school graduation; 5 (*n* = 61) = University degree; For time anticipation and spatial anticipation lower scores represent a better performance.

**p* < 0.050

Table S2. Measures to control normal distribution, homoscedasticity assumption, internal consistency, and criterion validity of all tests.

	<i>n</i>	<i>p</i> Shapiro Wilk test	<i>p</i> Levene tests	Cronbach's α	Criterion validity <i>r</i>
<i>The Vienna Test System</i>					
Spatial working memory	86	.020	.876	.791	0.21
Visual orientation	86	<.001	.666	.890	0.33
Perceptual speed	69	.647	.571	.740	0.37
Time anticipation	86	<.001	.034	.962	0.29
Spatial anticipation	86	.368	.130	.719	0.29

Note: $p < 0.050$ in the Shapiro Wilk and Levene test demonstrate a significant violation of the normal distribution and homoscedasticity respectively. Criterion validity was derived from the validation tests conducted by the creators¹ of the different cognitive tests.

¹ Schuhfried, G. (2013). Vienna Test System: Psychological Assessment. Moedling, Austria: Schuhfried

Table S3. Results of the overall non-parametric tests (Kruskal Wallis tests) for all performance scores between all groups.

		Kruskal Wallis tests	
	<i>n</i>	<i>H</i> value	<i>P</i> value
<i>The Vienna Test System</i>			
Spatial working memory	86	11.30	.014
Visual orientation	86	1.14	.565
Perceptual speed	69	3.73	.155
Time anticipation	86	5.576	.056
Spatial anticipation	86	22.47	<.001

Note: *H* is the test statistic for the Kruskal Wallis test. Under the null hypothesis, the chi-square distribution approximates the distribution of *H*. The p-value of the spatial working memory task is not statistically significant after the Bonferroni correction.

Table S4. Results of pairwise comparisons (Kruskal Wallis Test) of the statistically significant performance scores between all groups.

		Pairwise comparisons		
		z value	p value	Effect size <i>r</i>
Spatial working memory	Elite referees—amateur referees	2.70	.021	.529
	Elite referees—novices	-0.25	.998	.049
	Amateur referees - novices	3.06	.007	.558
Spatial anticipation	Elite referees—amateur referees	-4.45	<.001	.872
	Elite referees - novices	-3.76	.001	.737
	Amateur referees - novices	-0.72	.999	.131

Note: Effect size *r* is categorized as followed; 0.1 to 0.3: small effect; 0.3 to 0.5: medium effect; 0.5 and higher: large effect.