

Effects of Spatial Abilities and Domain on Estimation of Pearson's Correlation Coefficient

Supplementary Material

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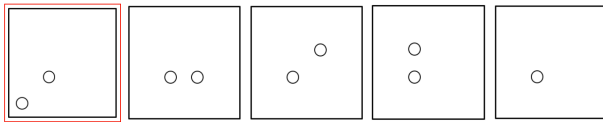
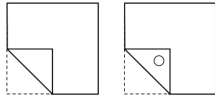
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1 SUPP MATERIAL - PART 1 PAPER FOLDING TASK

Question 1

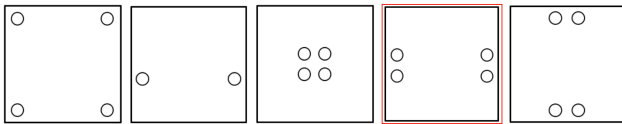
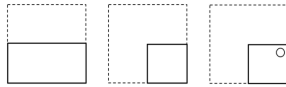
Give it a go!



Press Next after you've selected your guess!

Next

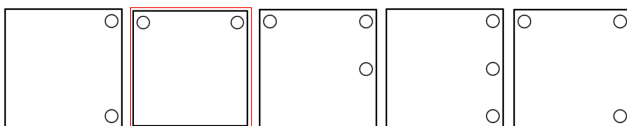
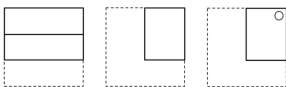
Question 2



Press Next after you've selected your guess!

Next

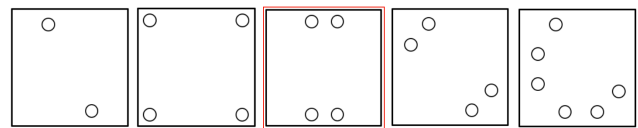
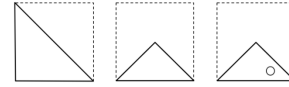
Question 3



Press Next after you've selected your guess!

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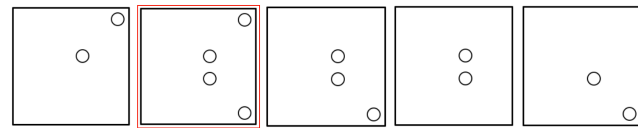
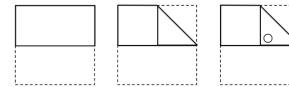
Question 4



Press Next after you've selected your guess!

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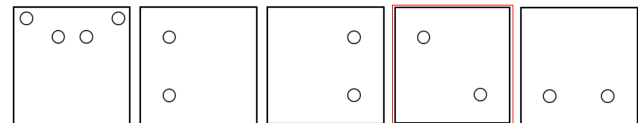
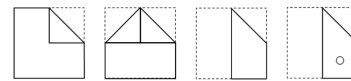
Question 5



Press Next after you've selected your guess!

Next

Question 6

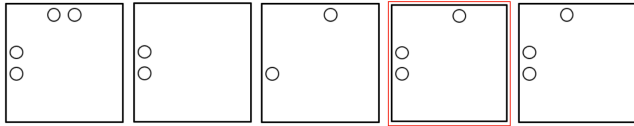
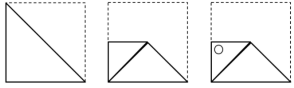


Press Next after you've selected your guess!

Next

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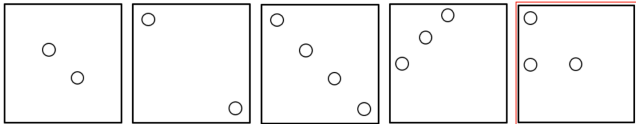
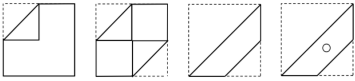
Question 7



Press Next after you've selected your guess!

Next

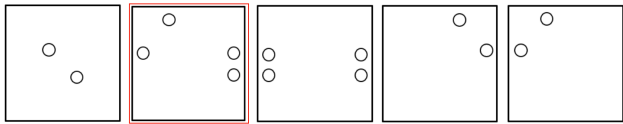
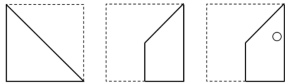
Question 8



Press Next after you've selected your guess!

Next

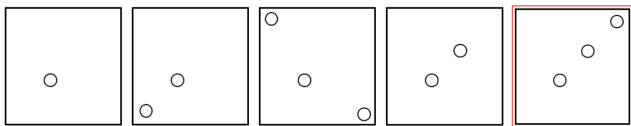
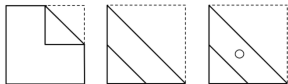
Question 9



Press Next after you've selected your guess!

Next

Question 10



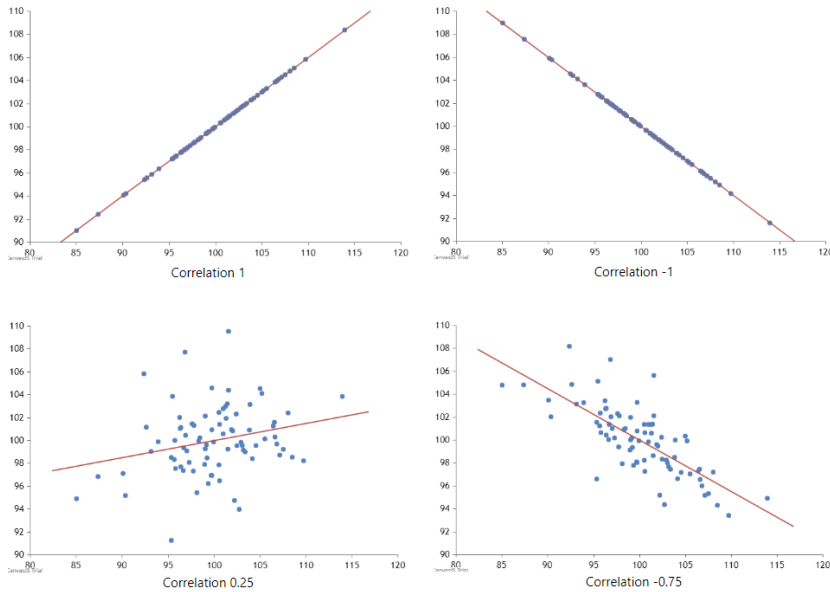
Press Next after you've selected your guess!

Next

2 SUPP MATERIAL - TRAINING FOR PART 2 - SCREENSHOTS

The **Pearson correlation** measures the strength of the linear relationship between two variables. It has a value between -1 to 1, with a value of -1 meaning a total negative linear correlation, 0 being no correlation, and + 1 meaning a total positive correlation.

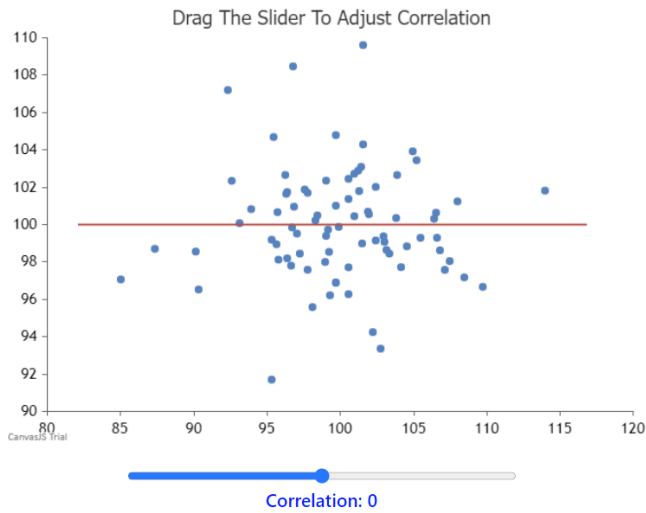
Here are some examples of a chart with a correlation of 1, -1, 0.25, and -0.75.



Training - Basic instructions of PCC

You will use the following chart to estimate Pearson's correlation in the study. Go ahead and get used to dragging the slider and seeing how the correlation changes as the slider moves.

When the study begins, **the correlation will not appear** and you will have to make an estimation on your own.

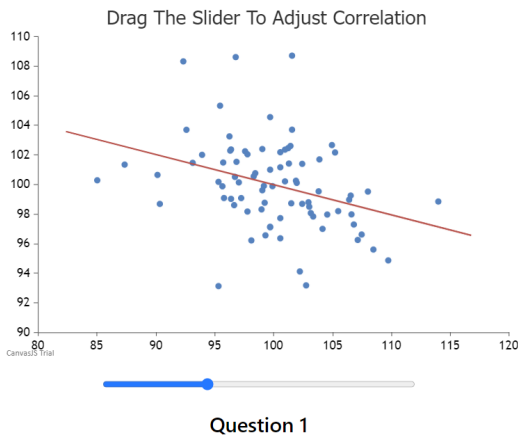


Example Question:

Drag the slider so that the correlation of the chart is **0.5** in your best estimation.

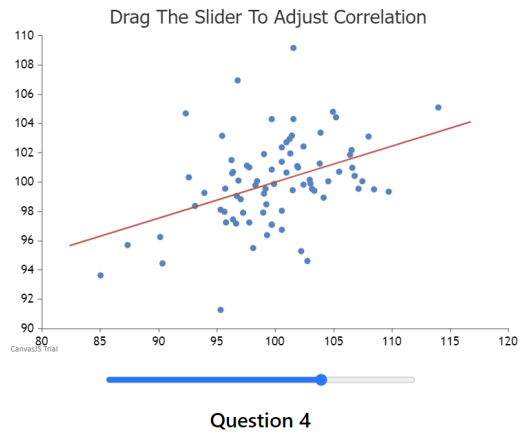
Training - slider introduction to participants

3 SUPP MATERIAL - MAIN QUESTION EXAMPLES
(PARTICIPANTS MUST MOVE SLIDER TO CLICK NEXT
23 TARGETS OFFERED BETWEEN -1,1)



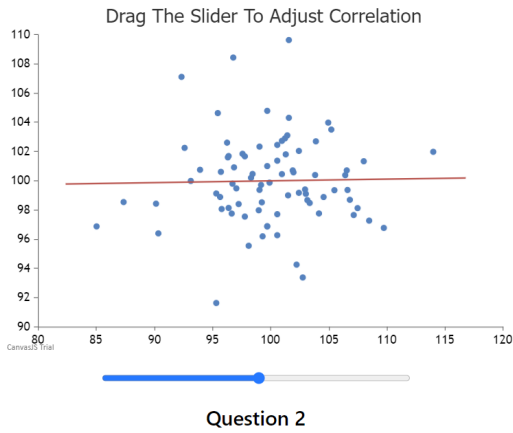
Drag the slider so that the correlation of the chart is **-0.7** in your best estimation

Next



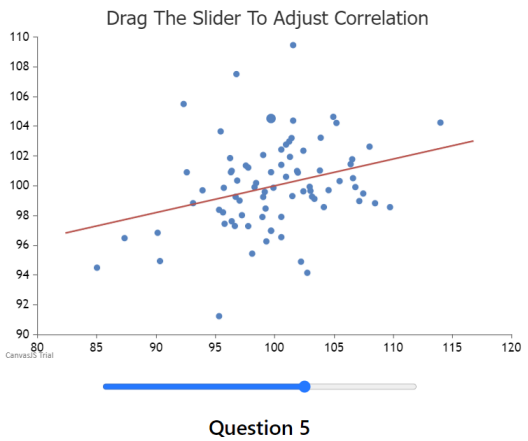
Drag the slider so that the correlation of the chart is **-0.9** in your best estimation

Next



Drag the slider so that the correlation of the chart is **-0.3** in your best estimation.

Next



Drag the slider so that the correlation of the chart is **0.4** in your best estimation

Next

**4 SUPP MATERIAL - FINAL QUESTIONS
(DIFFICULTY AND MOTIVATION)**

Final Questions & Feedback

How difficult was Part 1 (paper folding game) for you?

- Easy Fairly Easy Neither Fairly Difficult Difficult

How difficult was Part 2 (graphs and multiple choice questions) for you?

- Easy Fairly Easy Neither Fairly Difficult Difficult

Please respond to each of the following statements:

I spend a lot of my own time learning about data visualization.

- Never Rarely Sometimes Often Always

My career or studies involve data visualization.

- Never Rarely Sometimes Often Always

I am confident I perform well on data visualization tasks.

- Never Rarely Sometimes Often Always

I put effort into learning how to use data visualization.

- Never Rarely Sometimes Often Always

I become anxious when math is involved in data visualization.

- Never Rarely Sometimes Often Always

Do you have any feedback or concerns regarding the study to share with the researchers? *(optional)*

Feedback

This is the final page of questions!

Submit

Final questions assessing difficulty and motivation. First two questions assess difficulty of each part.

Intrinsic Motivation: I spend a lot of my own time learning about data visualization

Extrinsic Motivation: My career or studies involve data visualization

Self-Efficacy: I am confident I perform well on data visualization tasks

Self-Determination: I put effort into learning how to use data visualization

Math Anxiety: I become anxious when math is involved in data visualization

Data Tables

Descriptive Statistics

Gender (n)		Highest Education Completed (n)		Mean Age
Men	35	Bachelor's/Undergraduate	33	30 ±9
Women	25	Masters or PhD	27	

Overall Spatial Visualization Score (± 95% CI)	Motivation Score	Spatial Ability Difficulty	PCC estimation Difficulty
4.7 ± 0.53	11.3 / 20	2.03 / 4	1.80 / 4

Overall Stimuli (± 95% CI)

Mean Response Time (s) Per Question	9.90 ± 3.4
Mean Difference	0.17 ± 0.06

How to read the table:

The table below displays (from the left) the means (± 95% CI) of the two groups being compared over the variable displayed in each row. It then shows the statistical difference between the means followed by the lower and upper bounds of the 95% CI of the difference. If the interval does not overlap 0 the difference is significant at $p < 0.05$. The farther from 0 and the tighter it is, the stronger the evidence. Last, the table shows the p-value and test statistic of Welch's t test.

Note: the mean difference and intervals were generated using bias-corrected and accelerated bootstrapping with 5000 iterations.

Rows alternate between response time (RT) in seconds and mean differences (closer to 0 the more accurate).

Highlighted rows denote significance at $p \leq 0.05$.

The following tables are read in a similar fashion.

Gender Performances Overall

	Female Mean	Male Mean	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Spatial Ability Score	5.36 ± 0.75	4.29 ± 0.72	1.07	0.0	2.23	0.009	-1.69
Overall RT (s)	8.69 ± 2.43	10.76 ± 5.67	-2.07	-4.04	-0.75	0.01	2.53
Overall Mean Diffs	0.13 ± 0.07	0.19 ± 0.08	-0.06	-0.09	-0.03	0.00003	4.19

Education Level Performances Overall

	Grad Mean	Undergrad Mean	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Spatial Ability Score	5.48 ± 0.81	4.12 ± 0.67	1.36	0.11	2.60	0.03	-2.13
Overall RT (s)	8.02 ± 2.54	11.44 ± 5.91	-3.31	-5.55	-2.01	0.00007	4.0
Overall Mean Diffs	0.14 ± 0.08	0.19 ± 0.08	-0.05	-0.08	-0.02	0.001	3.22

Age Group Performances Overall

	Over-30 Mean	Under-30 Mean	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Spatial Ability Score	4.31 ± 0.75	5.38 ± 0.68	1.07	-0.19	2.22	0.08	-1.74
Overall RT (s)	11.02 ± 5.46	8.22 ± 2.72	-2.80	-4.83	-1.49	0.0005	3.46
Overall Mean Diffs	0.21 ± 0.08	0.10 ± 0.06	-0.11	-0.14	-0.08	3.4E-15	7.80

ANCOVA Analysis

	Coef	Std Err	<i>t</i>	<i>P</i> > <i>t</i>	[0.025	0.975]
Intercept	0.31	0.05	6.27	0.000	0.216	0.412
Spatial Ability (SA)	-0.049	0.009	-5.214	0.000	-0.067	-0.031
Domain	0.2226	0.041	5.433	0.000	0.142	0.303
Gender	0.1118	0.036	3.113	0.002	0.041	0.182
Age Group	-0.1070	0.036	-2.984	0.003	-0.177	-0.037
Education Level	-0.0763	0.036	-2.135	0.033	-0.146	-0.006
Motivation	-0.0025	0.002	-1.227	0.220	-0.006	0.001
SA * Gender	-0.0177	0.007	-2.658	0.008	-0.031	-0.005
SA * Age Group	0.0226	0.008	2.957	0.003	0.008	0.038
SA * Education	0.0252	0.006	3.889	0.000	0.012	0.038
Domain * SA	-0.0034	0.007	-0.498	0.006	-0.017	-0.010
Domain * Gender	0.0503	0.033	1.518	0.129	-0.015	0.115
Domain * Age	-0.0978	0.033	-2.926	0.003	-0.163	-0.032
Domain * Education	-0.1219	0.032	-3.838	0.000	-0.184	-0.060

Regression Linear Model (Huber)

	Coef	Std Err	<i>z</i>	<i>P</i> > <i>z</i>	[0.025	0.975]
Intercept	0.1986	0.024	8.409	0.000	0.152	0.245
Spatial Ability (SA)	-0.0292	0.004	-6.576	0.000	-0.038	-0.020
Domain	0.2129	0.019	11.024	0.000	0.175	0.251
Gender	0.0700	0.017	4.137	0.000	0.037	0.103
Age Group	-0.0710	0.017	-4.197	0.000	-0.104	-0.038
Education Level	-0.0740	0.017	-4.397	0.000	-0.107	-0.041
Motivation	-0.0022	0.001	-2.310	0.021	-0.004	-0.000
SA * Gender	-0.0107	0.003	-3.410	0.001	-0.017	-0.005
SA * Age Group	0.0156	0.004	4.339	0.000	0.009	0.023
SA * Education	0.0208	0.003	6.838	0.000	0.015	0.027
Domain * SA	-0.0113	0.003	-3.565	0.000	-0.018	-0.005
Domain * Gender	0.0439	0.016	2.807	0.005	0.013	0.075
Domain * Age	-0.0682	0.016	-4.328	0.000	-0.099	-0.037
Domain * Education	-0.0921	0.015	-6.152	0.000	-0.121	-0.063

Performance by Spatial Visualization Level

Low Spatial Participants

Domain (n)		Gender (n)		Highest Education Completed (n)		Age Group (n)	
Psych	12	Men	22	Bachelor's/Undergraduate	20	Under-30	9
MCS	19	Women	9	Masters or PhD	11	Over-30	22

High Spatial Participants

Domain (n)		Gender (n)		Highest Education Completed (n)		Age Group (n)	
Psych	18	Men	16	Bachelor's/Undergraduate	13	Under-30	15
MCS	11	Women	13	Masters or PhD	16	Over-30	14

Mean Differences of Low v High Spatial Visualization

	Low SV	High SV	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.65 ± 0.31	6.97 ± 0.44	-4.32	-4.96	-3.72	5.89E-18	13.13
Overall RT(s)	11.49 ± 6.04	8.20 ± 3.46	3.29	1.79	5.46	0.0003	-3.65
Overall Diffs	0.25 ± 0.10	0.08 ± 0.04	0.16	0.138	0.192	1.07E-29	-11.76
Motivation	12.1 ± 1.09	10.44 ± 1.09	1.65	-0.14	3.41	0.084	-1.756
Sp Vis Difficulty	1.94 ± 0.32	2.14 ± 0.34	-0.20	-0.75	0.35	0.48	0.71
PCC Difficulty	2.26 ± 0.34	1.31 ± 0.30	0.95	0.40	1.46	0.001	-3.456
Training Time	55.17 ± 9.68	46.69 ± 9.08	8.49	-8.18	2.33	0.297	-1.05

		Low Spatial	High Spatial	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
-1.0	RT (s)	6.62 ± 1.34	5.40 ± 0.94	1.22	-0.578	3.25	0.223	-1.23
	Diffs	0.31 ± 0.14	0.09 ± 0.08	0.22	0.034	0.41	0.033	-2.20
-0.9	RT (s)	22.65 ± 18.78	8.05 ± 2.55	14.59	1.13	62.65	0.21	-1.27
	Diffs	0.35	0.07	0.28	0.13	0.51	0.006	-2.903761
-0.8	RT (s)	11.65 ± 3.19	6.62 ± 1.76	5.03	1.15	9.80	0.02	-2.27
	Diffs	0.31 ± 0.10	0.11 ± 0.06	0.20	0.07	0.357	0.008	-2.76
-0.7	RT (s)	15.62 ± 5.06	9.97 ± 2.11	5.65	0.543	14.29	0.098	-1.69
	Diffs	0.25 ± 0.09	0.09 ± 0.03	0.16	0.069	0.33	0.01	-2.57
-0.6	RT (s)	10.34 ± 2.95	8.43 ± 2.18	1.91	-2.27	6.38	0.39	-0.86
	Diffs	0.24 ± 0.07	0.10 ± 0.03	0.13	0.05	0.23	0.006	-2.88
-0.5	RT (s)	15.81 ± 10.83	7.39 ± 1.40	8.42	0.927	35.44	0.21	-1.27
	Diffs	0.29 ± 0.10	0.09 ± 0.03	0.20	0.095	0.36	0.004	-3.10

		Low Spatial	High Spatial	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
-0.4	RT (s)	9.62 ± 2.7	14.84 ± 11.46	-5.22	-32.36	3.07	0.41	0.73
	Diffs	0.23 ± 0.08	0.07 ± 0.02	0.16	0.06	0.28	0.004	-3.07
-0.3	RT (s)	8.67 ± 1.9	7.22 ± 1.93	1.46	-2.16	4.21	0.38	-0.89
	Diffs	0.22 ± 0.08	0.10 ± 0.03	0.12	0.03	0.23	0.02	-2.34
-0.2	RT (s)	8.27 ± 1.56	9.63 ± 4.38	-1.36	-11.46	2.16	0.63	0.48
	Diffs	0.21 ± 0.07	0.08 ± 0.02	0.14	0.06	0.23	0.003	-3.15
-0.1	RT (s)	9.83 ± 2.5	6.64 ± 1.05	3.19	0.57	7.07	0.06	-1.93
	Diffs	0.22 ± 0.08	0.05 ± 0.01	0.18	0.09	0.30	0.001	-3.43
0.0	RT (s)	8.51 ± 1.14	9.55 ± 2.15	-1.04	-4.52	1.40	0.49	0.70
	Diffs	0.11 ± 0.07	0.007 ± 0.002	0.10	0.04	0.21	0.02	-2.45
0.1	RT (s)	13.55 ± 4.23	7.16 ± 1.42	6.39	2.70	14.14	0.02	-2.35
	Diffs	0.20 ± 0.09	0.06 ± 0.02	0.13	0.05	0.26	0.01	-2.49
0.2	RT (s)	13.58 ± 6.75	7.56 ± 1.49	6.01	0.52	19.10	0.16	-1.43
	Diffs	0.25 ± 0.08	0.06 ± 0.01	0.19	0.11	0.31	0.0004	-3.89
0.3	RT (s)	9.16 ± 2.02	7.53 ± 1.16	1.63	-0.74	4.73	0.26	-1.15
	Diffs	0.20 ± 0.05	0.10 ± 0.04	0.10	0.01	0.17	0.02	-2.46
0.4	RT (s)	14.15 ± 4.77	7.05 ± 1.63	7.10	2.23	14.76	0.03	-2.32
	Diffs	0.21 ± 0.07	0.11 ± 0.04	0.10	0.01	0.20	0.06	-1.96
0.5	RT (s)	9.98 ± 2.40	13.81 ± 6.48	-3.82	-15.76	2.18	0.37	0.91
	Diffs	0.22 ± 0.08	0.11 ± 0.05	0.11	0.01	0.24	0.05	-1.88
0.6	RT (s)	11.76 ± 4.20	7.92 ± 1.98	3.84	-0.36	11.14	0.18	-1.36
	Diffs	0.22 ± 0.07	0.09 ± 0.03	0.13	0.05	0.23	0.008	-2.81
0.7	RT (s)	13.51 ± 4.79	8.83 ± 2.61	4.68	-0.88	12.69	0.17	-1.41
	Diffs	0.35 ± 0.12	0.08 ± 0.03	0.26	0.13	0.44	0.001	-3.42
0.8	RT (s)	11.14 ± 5.55	5.68 ± 0.87	5.46	1.35	18.90	0.12	-1.60
	Diffs	0.25 ± 0.10	0.11 ± 0.04	0.13	0.03	0.28	0.04	-2.07
0.9	RT (s)	8.08 ± 2.27	6.58 ± 1.33	1.50	-1.13	5.15	0.35	-0.94
	Diffs	0.22 ± 0.08	0.11 ± 0.07	0.10	-0.03	0.23	0.11	-1.60
1.0	RT (s)	8.79 ± 2.19	6.40 ± 2.16	2.39	-1.63	5.60	0.21	-1.28
	Diffs	0.35 ± 0.16	0.04 ± 0.05	0.30	0.13	0.55	0.006	-2.91

Spatial Visualization Level Split by Demographics

	n			n
Low Spatial Men	22		High Spatial Men	13
Low Spatial Women	9		High Spatial Women	16

	LS: Women	LS: Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.78 ± 0.53	2.59 ± 0.39	0.19	-0.62	0.86	0.65	-0.47
Overall RT (s)	10.07 ± 4.00	12.07 ± 8.06	-1.99	-4.899	-0.026	0.09	1.67
Overall Diffs	0.19 ± 0.14	0.27 ± 0.12	-0.08	-0.13	-0.03	0.001	3.30

	HS: Men	LS: Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	7.15 ± 0.76	2.59 ± 0.39	4.56	3.64	5.56	5.94E-08	-8.77
Overall RT (s)	8.56 ± 6.78	12.07 ± 8.06	-3.51	-6.35	-0.78	0.01	2.53
Overall Diffs	0.06 ± 0.03	0.27 ± 0.12	-0.21	-0.25	-0.18	2.27E-31	12.45

	HS: Women	LS: Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	6.81 ± 0.53	2.59 ± 0.39	4.22	3.47	4.97	1.27E-11	-10.67
Overall RT (s)	7.92 ± 3.02	12.07 ± 8.06	-4.15	-6.94	-2.38	0.0003	3.64
Overall Diffs	0.10 ± 0.07	0.27 ± 0.12	-0.17	-0.21	-0.13	7.03E-19	9.14

	HS: Women	HS: Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	6.81 ± 0.53	7.15 ± 0.76	-0.34	-1.39	0.72	0.55	0.61
Overall RT (s)	7.92 ± 3.02	8.56 ± 6.78	-0.638	-3.29	0.82	0.52	0.65
Overall Diffs	0.10 ± 0.07	0.06 ± 0.03	0.04	0.02	0.06	0.00002	-4.26

	LS: Women	HS: Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.78 ± 0.53	7.15 ± 0.76	4.38	3.34	5.48	2.31E-07	-7.72
Overall RT (s)	10.07 ± 4.00	8.56 ± 6.78	-1.52	-3.28	0.93	0.15	1.45
Overall Diffs	0.19 ± 0.14	0.06 ± 0.03	-0.13	-0.17	-0.09	3.40E-10	6.60

	LS: Women	HS: Women	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.78 ± 0.53	6.81 ± 0.52	-4.03	-4.92	-3.23	1.72E-08	-8.87
Overall RT (s)	10.07 ± 4.00	7.92 ± 3.02	2.16	0.89	3.46	0.001	3.24
Overall Diffs	0.19 ± 0.14	0.10 ± 0.07	0.09	0.05	0.13	0.000044	4.16

	n		n
Low Spatial Under-30	9	High Spatial Under-30	15
Low Spatial Over-30	22	High Spatial Over-30	14

	LS: Over-30	LS: Under-30	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.41 ± 0.34	3.22 ± 0.60	-0.81	-1.44	0.17	0.073	1.95
Overall RT (s)	12.49 ± 7.96	9.05 ± 4.84	3.43	1.29	6.27	0.006	-2.78
Overall Diffs	0.28 ± 0.12	0.16 ± 0.13	0.13	0.08	0.17	1.10E-07	-5.39

	HS: Under-30	LS: Under-30	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	6.67 ± 0.50	3.22 ± 0.60	3.44	2.64	4.44	9.40E-07	-7.27
Overall RT (s)	7.72 ± 3.23	9.05 ± 4.84	-1.33	-3.03	0.11	0.09	1.73
Overall Diffs	0.07 ± 0.04	0.16 ± 0.13	-0.08	-0.13	-0.05	0.000012	4.48

	HS: Over-30	LS: Under-30	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	7.29 ± 0.74	3.22 ± 0.60	4.06	3.06	5.26	6.32E-07	-7.02
Overall RT (s)	8.72 ± 6.28	9.05 ± 4.84	-0.33	-2.35	1.81	0.75	0.32
Overall Diffs	0.10 ± 0.07	0.16 ± 0.13	-0.06	-0.10	-0.03	0.003	3.01

	HS: Over-30	HS: Under-30	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	7.29 ± 0.74	6.67 ± 0.50	0.62	-0.42	1.67	0.27	-1.14
Overall RT (s)	8.72 ± 6.28	7.72 ± 3.23	1.00	-0.39	3.50	0.29	-1.07
Overall Diffs	0.10 ± 0.07	0.07 ± 0.04	0.02	0.004	0.05	0.03	-2.19

	LS: Over-30	HS: Under-30	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.41 ± 0.34	6.67 ± 0.50	-4.26	-4.93	-3.55	8.16E-12	11.64
Overall RT (s)	12.49 ± 7.96	7.72 ± 3.23	4.77	3.00	7.83	0.00003	-4.18
Overall Diffs	0.28 ± 0.12	0.07 ± 0.04	0.21	0.18	0.25	7.09E-31	-12.27

	LS: Over-30	HS: Over-30	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.41 ± 0.34	7.29 ± 0.74	-4.88	-5.80	-3.91	8.74E-09	-9.87
Overall RT (s)	12.49 ± 7.96	8.72 ± 6.28	3.77	1.23	6.63	0.005	2.80
Overall Diffs	0.28 ± 0.12	0.10 ± 0.07	0.19	0.15	0.23	1.40E-22	10.13

	n		n
Low Spatial Undergraduates	20	High Spatial Undergraduates	13
Low Spatial Graduates	11	High Spatial Graduates	16

	LS: Grad	LS: Undergrad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	2.82 ± 0.37	2.55 ± 0.44	0.27	-0.40	0.93	0.45	-0.77
Overall RT (s)	8.93 ± 4.34	12.90 ± 8.69	-3.97	-7.16	-2.02	0.002	3.08
Overall Diffs	0.21 ± 0.16	0.27 ± 0.12	-0.06	-0.11	-0.002	0.03	2.18

	HS: Undergrad	LS: Undergrad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	6.54 ± 0.63	2.55 ± 0.44	3.99	3.15	4.88	1.54E-08	-8.51
Overall RT (s)	9.19 ± 6.72	12.90 ± 8.69	-3.71	-6.76	-1.10	0.01	2.55
Overall Diffs	0.07 ± 0.05	0.27 ± 0.12	-0.20	-0.24	-0.17	4.59E-27	11.40

	HS: Grad	LS: Undergrad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	7.31 ± 0.60	2.55 ± 0.44	4.76	3.89	5.63	1.78E-11	-10.60
Overall RT (s)	7.40 ± 3.07	12.90 ± 8.69	-5.50	-8.72	-3.68	0.000009	4.50
Overall Diffs	0.10 ± 0.06	0.27 ± 0.12	-0.17	-0.21	-0.14	5.97E-20	9.47

	HS: Undergrad	HS: Grad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	6.54 ± 0.63	7.31 ± 0.60	-0.77	-1.74	0.25	0.15	1.46
Overall RT (s)	9.19 ± 6.72	7.40 ± 3.07	1.79	0.34	4.43	0.05	-1.82
Overall Diffs	0.07 ± 0.05	0.10 ± 0.06	-0.03	-0.05	-0.006	0.009	2.59

	HS: Undergrad	LS: Grad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	6.54 ± 0.63	2.82 ± 0.37	3.72	2.90	4.57	9.46E-08	-8.32
Overall RT (s)	9.19 ± 6.72	8.93 ± 4.34	0.26	-1.38	2.98	0.81	-0.25
Overall Diffs	0.07 ± 0.05	0.21 ± 0.16	-0.14	-0.19	-0.10	4.01E-10	6.49

	HS: Grad	LS: Grad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	7.31 ± 0.60	2.82 ± 0.37	4.49	3.67	5.27	2.14E-10	-10.53
Overall RT (s)	7.40 ± 3.07	8.93 ± 4.34	-1.53	-3.01	-0.24	0.03	2.17
Overall Diffs	0.10 ± 0.06	0.21 ± 0.16	-0.11	-0.16	-0.07	5.08E-07	5.14

Spatial Visualization between Domains

Totals (n)		Spatial Visualization Scores	
Psych	30	Psych	5.63 ± 0.80
MCS	30	MCS	3.83 ± 0.61

Differences of Spatial Visualization Scores

	Mean	Mean	Difference	95CI - Low	95CI - High	MW p-value	MW Statistic
Psych v MCS	5.63 ± 0.80	3.83 ± 0.61	1.80	0.6	2.97	0.004	-2.95

Performance by Domain

Psych Participants

Spatial Ability (n)		Gender (n)		Highest Education Completed (n)		Age Group (n)	
Low Spatial	12	Men	17	Bachelor's/Undergraduate	12	Under-30	11
High Spatial	19	Women	13	Masters or PhD	18	Over-30	19

MCS Participants

Spatial Ability (n)		Gender (n)		Highest Education Completed (n)		Age Group (n)	
Low Spatial	19	Men	22	Bachelor's/Undergraduate	21	Under-30	13
High Spatial	11	Women	8	Masters or PhD	9	Over-30	17

Mean Differences of Psych vs MCS

	Psych	MCS	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	5.63 ± 0.80	3.83 ± 0.61	1.80	0.60	2.97	0.004	-2.95
Overall RT (s)	50.98 ± 9.18	51.17 ± 9.81	-0.19	-16.19	15.39	0.98	0.98
Overall Diffs	0.19 ± 0.09	0.14 ± 0.07	0.05	0.02	0.08	0.0004	-3.54
Motivation	11.3 ± 1.23	11.3 ± 1.00	0.0	-1.93	1.87	1.0	0.0
Sp. Vis. Difficulty	2.07 ± 0.34	2.0 ± 0.33	0.07	-0.5	0.6	0.82	-0.23
PCC Difficulty	2.07 ± 0.34	1.53 ± 0.34	0.53	-0.07	1.07	0.08	-1.81
Training Time	17.07 ± 3.46	22.53 ± 5.12	-5.46	-8.61	-2.82	0.0001	3.81

		Low Spatial	High Spatial	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
-1.0	RT (s)	6.48 ± 1.01	5.58 ± 1.32	0.90	-1.37	2.65	0.38	-0.89
	Diffs	0.25 ± 0.14	0.15 ± 0.09	0.10	-0.08	0.32	0.36	-0.93
-0.9	RT (s)	18.73 ± 18.78	12.46 ± 6.16	6.27	-7.91	48.06	0.60	-0.52
	Diffs	0.26 ± 0.13	0.17 ± 0.11	0.09	-0.11	0.29	0.41	-0.82
-0.8	RT (s)	9.52 ± 3.17	8.93 ± 2.22	0.59	-3.40	5.57	0.80	-0.25
	Diffs	0.22 ± 0.08	0.20 ± 0.98	0.03	-0.14	0.16	0.73	-0.35

		Low Spatial	High Spatial	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
-0.4	RT (s)	9.62 ± 2.7	14.84 ± 11.46	-5.22	-32.36	3.07	0.41	0.73
	Diffs	0.23 ± 0.08	0.07 ± 0.02	0.16	0.06	0.28	0.004	-3.07
-0.3	RT (s)	8.67 ± 1.9	7.22 ± 1.93	1.46	-2.16	4.21	0.38	-0.89
	Diffs	0.22 ± 0.08	0.10 ± 0.03	0.12	0.03	0.23	0.02	-2.34
-0.2	RT (s)	8.27 ± 1.56	9.63 ± 4.38	-1.36	-11.46	2.16	0.63	0.48
	Diffs	0.21 ± 0.07	0.08 ± 0.02	0.14	0.06	0.23	0.003	-3.15
-0.1	RT (s)	9.83 ± 2.5	6.64 ± 1.05	3.19	0.57	7.07	0.06	-1.93
	Diffs	0.22 ± 0.08	0.05 ± 0.01	0.18	0.09	0.30	0.001	-3.43
0.0	RT (s)	8.51 ± 1.14	9.55 ± 2.15	-1.04	-4.52	1.40	0.49	0.70
	Diffs	0.11 ± 0.07	0.007 ± 0.002	0.10	0.04	0.21	0.02	-2.45
0.1	RT (s)	13.55 ± 4.23	7.16 ± 1.42	6.39	2.70	14.14	0.02	-2.35
	Diffs	0.20 ± 0.09	0.06 ± 0.02	0.13	0.05	0.26	0.01	-2.49
0.2	RT (s)	13.58 ± 6.75	7.56 ± 1.49	6.01	0.52	19.10	0.16	-1.43
	Diffs	0.25 ± 0.08	0.06 ± 0.01	0.19	0.11	0.31	0.0004	-3.89
0.3	RT (s)	9.16 ± 2.02	7.53 ± 1.16	1.63	-0.74	4.73	0.26	-1.15
	Diffs	0.20 ± 0.05	0.10 ± 0.04	0.10	0.01	0.17	0.02	-2.46
0.4	RT (s)	14.15 ± 4.77	7.05 ± 1.63	7.10	2.23	14.76	0.03	-2.32
	Diffs	0.21 ± 0.07	0.11 ± 0.04	0.10	0.01	0.20	0.06	-1.96
0.5	RT (s)	9.98 ± 2.40	13.81 ± 6.48	-3.82	-15.76	2.18	0.37	0.91
	Diffs	0.22 ± 0.08	0.11 ± 0.05	0.11	0.01	0.24	0.05	-1.88
0.6	RT (s)	11.76 ± 4.20	7.92 ± 1.98	3.84	-0.36	11.14	0.18	-1.36
	Diffs	0.22 ± 0.07	0.09 ± 0.03	0.13	0.05	0.23	0.008	-2.81
0.7	RT (s)	13.51 ± 4.79	8.83 ± 2.61	4.68	-0.88	12.69	0.17	-1.41
	Diffs	0.35 ± 0.12	0.08 ± 0.03	0.26	0.13	0.44	0.001	-3.42
0.8	RT (s)	11.14 ± 5.55	5.68 ± 0.87	5.46	1.35	18.90	0.12	-1.60
	Diffs	0.25 ± 0.10	0.11 ± 0.04	0.13	0.03	0.28	0.04	-2.07
0.9	RT (s)	8.08 ± 2.27	6.58 ± 1.33	1.50	-1.13	5.15	0.35	-0.94
	Diffs	0.22 ± 0.08	0.11 ± 0.07	0.10	-0.03	0.23	0.11	-1.60
1.0	RT (s)	8.79 ± 2.19	6.40 ± 2.16	2.39	-1.63	5.60	0.21	-1.28
	Diffs	0.35 ± 0.16	0.04 ± 0.05	0.30	0.13	0.55	0.006	-2.91

Domain split by Spatial Visualization

	n			n
Low Spatial Psych	12		High Spatial Psych	18
Low Spatial MCS	19		High Spatial MCS	11

		LS: MCS	LS: Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		2.58 ± 0.42	2.75 ± 0.46	-0.17	-0.86	0.56	0.66	0.45
Overall	RT (s)	9.42 ± 4.02	14.76 ± 9.5	-5.34	-10.68	-2.68	0.004	2.85
Overall	Diffs	0.19 ± 0.11	0.33 ± 0.18	-0.14	-0.20	-0.09	3.76E-07	5.16

		HS: Psych	LS: Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		7.56 ± 0.50	2.75 ± 0.46	4.81	4.03	5.56	3.83E-12	-11.63
Overall	RT (s)	7.87 ± 4.9	14.76 ± 9.5	-6.89	-12.35	-4.11	0.0003	3.61
Overall	Diffs	0.10 ± 0.06	0.33 ± 0.18	-0.23	-0.28	-0.19	9.68E-19	9.44

		HS: MCS	LS: Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		6.0 ± 0.59	2.75 ± 0.46	3.25	2.47	4.20	7.18E-07	-7.18
Overall	RT (s)	8.74 ± 4.5	14.76 ± 9.5	-6.02	-11.30	-3.19	0.002	3.18
Overall	Diffs	0.05 ± 0.04	0.33 ± 0.18	-0.28	-0.33	-0.24	5.42E-26	11.72

		HS: MCS	HS: Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		6.0 ± 0.59	7.56 ± 0.50	-1.56	-2.38	-0.63	0.003	3.31
Overall	RT (s)	8.74 ± 4.5	7.87 ± 4.9	0.87	-0.80	2.56	0.32	-0.99
Overall	Diffs	0.05 ± 0.04	0.10 ± 0.06	-0.05	-0.06	-0.03	3.56E-07	5.15

		LS: MCS	HS: Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		2.58 ± 0.42	7.56 ± 0.50	-4.98	-5.73	-4.22	3.51E-14	12.48
Overall	RT (s)	9.42 ± 4.02	7.87 ± 4.9	1.55	-0.44	2.98	0.06	-1.85
Overall	Diffs	0.19 ± 0.11	0.10 ± 0.06	0.09	0.06	0.12	3.88E-08	-5.57

		HS: MCS	LS: MCS	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		6.0 ± 0.59	2.58 ± 0.42	3.42	2.63	4.30	1.74E-07	-7.78
Overall	RT (s)	8.74 ± 4.5	9.42 ± 4.02	-0.68	-2.13	1.08	0.40	0.85
Overall	Diffs	0.05 ± 0.04	0.19 ± 0.11	-0.14	-0.17	-0.11	2.12E-18	9.11

Domain split by Demographics

	n		n
Psych Men	13	MCS Men	22
Psych Women	17	MCS Women	8

		MCS Men	Psych Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		3.73 ± 0.69	5.23 ± 1.50	-1.50	-3.53	0.28	0.15	1.50
Overall	RT (s)	9.43 ± 3.9	13.02 ± 10	-3.59	-8.80	-0.80	0.05	1.90
Overall	Diffs	0.16 ± 0.09	0.26 ± 0.16	-0.10	-0.15	-0.05	0.000065	4.03

		Psych Women	Psych Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		5.94 ± 0.84	5.23 ± 1.50	0.71	-1.41	2.61	0.51	-0.68
Overall	RT (s)	8.80 ± 3.15	13.02 ± 10	-4.22	-9.55	-1.52	0.02	2.26
Overall	Diffs	0.15 ± 0.08	0.26 ± 0.16	-0.11	-0.16	-0.06	0.000011	4.45

		MCS Women	Psych Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		4.13 ± 1.33	5.23 ± 1.50	-1.11	-3.35	1.13	0.38	0.90
Overall	RT (s)	8.46 ± 3.6	13.02 ± 10	-4.55	-10.02	-1.93	0.01	2.42
Overall	Diffs	0.10 ± 0.12	0.26 ± 0.16	-0.15	-0.20	-0.09	3.19E-08	5.63

		MCS Men	Psych Women	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		3.73 ± 0.69	5.94 ± 0.84	-2.21	-3.43	-0.93	0.001	3.36
Overall	RT (s)	9.43 ± 3.9	8.80 ± 3.15	0.63	-0.64	1.97	0.34	-0.95
Overall	Diffs	0.16 ± 0.09	0.15 ± 0.08	0.008	-0.023	0.038	0.61	-0.51

		MCS Women	Psych Women	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		4.13 ± 1.33	5.94 ± 0.84	-1.82	-3.44	0.09	0.08	1.89
Overall	RT (s)	8.46 ± 3.6	8.80 ± 3.15	-0.34	-1.49	0.98	0.60	0.53
Overall	Diffs	0.10 ± 0.12	0.15 ± 0.08	-0.05	-0.08	0.001	0.02	2.33

		MCS Women	MCS Men	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score		4.13 ± 1.33	3.73 ± 0.69	0.40	-1.26	2.07	0.67	-0.44
Overall	RT (s)	8.46 ± 3.6	9.43 ± 3.9	-0.97	-2.33	0.45	0.17	1.37
Overall	Diffs	0.10 ± 0.12	0.16 ± 0.09	-0.05	-0.09	-0.005	0.007	2.67

	n		n
Psych Under-30	11	MCS Under-30	19
Psych Over-30	19	MCS Over-30	17

	Under-30 MCS	Under-30 Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	4.54 ± 0.91	6.36 ± 0.84	-1.83	-3.21	0.38	0.06	2.43
Overall RT (s)	8.43 ± 4.29	7.97 ± 3.10	0.46	-0.82	1.96	0.52	-0.65
Overall Diffs	0.09 ± 0.08	0.11 ± 0.07	-0.02	-0.05	0.01	0.23	1.20

	Over-30 Psych	Under-30 Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	5.21 ± 1.15	6.36 ± 0.84	-1.15	-2.77	0.59	0.19	1.33
Overall RT (s)	12.17 ± 9.62	7.97 ± 3.10	4.19	2.15	7.85	0.001	-3.13
Overall Diffs	0.24 ± 0.12	0.11 ± 0.07	0.13	0.09	0.17	6.31E-11	-6.66

	Over-30 MCS	Under-30 Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	3.29 ± 0.77	6.36 ± 0.84	-3.07	-4.25	-1.67	0.0001	4.44
Overall RT (s)	9.74 ± 4.22	7.97 ± 3.10	1.77	0.47	3.16	0.01	-2.55
Overall Diffs	0.18 ± 0.11	0.11 ± 0.07	0.06	0.03	0.09	0.0002	-3.71

	Under-30 MCS	Over-30 Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	4.54 ± 0.91	5.21 ± 1.15	-0.67	-2.39	1.05	0.46	0.76
Overall RT (s)	8.43 ± 4.29	12.17 ± 9.62	-3.74	-7.35	-1.54	0.007	2.67
Overall Diffs	0.09 ± 0.08	0.24 ± 0.12	-0.15	-0.19	-0.11	1.25E-12	7.24

	Over-30 MCS	Over-30 Psych	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	3.29 ± 0.77	5.21 ± 1.15	-1.92	-3.52	-0.31	0.03	2.28
Overall RT (s)	9.74 ± 4.22	12.17 ± 9.62	-2.42	-5.96	-0.25	0.08	1.74
Overall Diffs	0.18 ± 0.11	0.24 ± 0.12	-0.06	-0.11	-0.02	0.003	2.93

	Over-30 MCS	Under-30 MCS	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	3.29 ± 0.77	4.54 ± 0.91	-1.24	-2.57	0.10	0.097	1.72
Overall RT (s)	9.74 ± 4.22	8.43 ± 4.29	1.31	-0.21	2.84	0.10	-1.65
Overall Diffs	0.18 ± 0.11	0.09 ± 0.08	0.08	0.04	0.12	0.000009	-4.48

	n		n
Psych Undergraduates	12	MCS Undergraduates	21
Psych Graduates	18	MCS Graduates	9

	MCS Grad	Psych Grad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	4.55 ± 1.34	5.94 ± 1.0	-1.39	-3.28	0.5	0.18	1.40
Overall RT (s)	7.59 ± 2.88	8.24 ± 3.53	-0.65	-1.83	0.51	0.28	1.08
Overall Diffs	0.11 ± 0.09	0.16 ± 0.10	-0.05	-0.08	-0.006	0.01	2.50

	Psych Undergrad	Psych Grad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	5.17 ± 1.34	5.94 ± 1.0	-0.78	-2.75	1.08	0.45	0.76
Overall RT (s)	14.21 ± 10.5	8.24 ± 3.53	5.96	3.09	11.69	0.002	-3.01
Overall Diffs	0.25 ± 0.16	0.16 ± 0.10	0.09	0.04	0.14	0.0003	-3.65

	MCS Undergrad	Psych Grad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	3.52 ± 0.66	5.94 ± 1.0	-2.42	-3.78	-1.01	0.002	3.33
Overall RT (s)	9.85 ± 4.13	8.24 ± 3.53	1.61	0.25	3.05	0.02	-2.23
Overall Diffs	0.16 ± 0.09	0.16 ± 0.10	-0.003	-0.04	0.03	0.87	0.17

	MCS Grad	Psych Undergrad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	4.55 ± 1.34	5.17 ± 1.34	-0.61	-2.56	1.67	0.60	0.54
Overall RT (s)	7.59 ± 2.88	14.21 ± 10.5	-6.62	-12.35	-3.79	0.0008	3.38
Overall Diffs	0.11 ± 0.09	0.25 ± 0.16	-0.14	-0.19	-0.09	1.66E-07	5.32

	MCS Undergrad	Psych Undergrad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	3.52 ± 0.66	5.17 ± 1.34	-1.64	-3.36	0.08	0.09	1.81
Overall RT (s)	9.85 ± 4.13	14.21 ± 10.5	-4.35	-9.86	-1.44	0.03	2.18
Overall Diffs	0.16 ± 0.09	0.25 ± 0.16	-0.09	-0.14	-0.05	0.0001	3.83

	MCS Grad	MCS Undergrad	Difference	95CI - Low	95CI - High	Welch's p-value	Welch's Statistic
Sp. Vis. Score	4.55 ± 1.34	3.52 ± 0.66	-1.03	-2.76	0.52	0.26	1.17
Overall RT (s)	7.59 ± 2.88	9.85 ± 4.13	2.27	0.97	3.55	0.0007	-3.39
Overall Diffs	0.11 ± 0.09	0.16 ± 0.09	0.05	0.002	0.08	0.01	-2.41