

Associations of Human Cognitive Abilities with Elevated Carbon Dioxide Concentrations in an Enclosed Chamber

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Table S1. GAMM results of the CO₂ effects on the cognitive test performance metrics.

Cognitive Tests	Performance Metrics (Unit)	Fixed Effects (<i>p</i> -Values)		
		Medium CO ₂ —Low CO ₂ (Reference)	High CO ₂ —Low CO ₂ (Reference)	High CO ₂ —Medium CO ₂ (Reference)
Simple RT	ACC _{sim} (%)	−0.48 (0.221)	−0.16 (0.682)	0.32 (0.413)
	CRT _{sim} (ms)	7.04 (0.269)	−3.18 (0.616)	−10.22 (0.110)
Discriminative RT	ACC _{dis} (%)	0.48 (0.554)	1.43 (0.078)	0.95 (0.238)
	CRT _{dis} (ms)	14.43 (0.287)	0.39 (0.977)	−14.03 (0.300)
Choice RT	ACC _{cho} (%)	1.11 (0.276)	0.95 (0.350)	−0.16 (0.876)
	CRT _{cho} (ms)	12.90 (0.258)	18.57 (0.105)	5.68 (0.617)
Speed perception	Deviation rate (%)	−0.04 (0.920)	−0.16 (0.661)	−0.12 (0.735)
	ACC _{total} (%)	−0.92 (0.110)	−0.25 (0.660)	0.67 (0.243)
	CRT _{total} (ms)	60.49 (0.150)	115.43 ** (0.007)	54.94 (0.190)
VS	ACC _{report} (%)	−1.33 (0.233)	−0.17 (0.881)	1.17 (0.296)
	CRT _{report} (ms)	−34.79 (0.259)	77.99 * (0.013)	112.78 ** (<0.001)
	False alert rate (%)	0.50 (0.382)	0.33 (0.560)	−0.17 (0.770)
	Missing report rate (%)	1.33 (0.233)	0.17 (0.881)	−1.17 (0.296)
2-back	ACC (%)	0.80 (0.161)	−0.12 (0.828)	−0.92 (0.106)
	CRT (ms)	−11.33 (0.527)	11.95 (0.505)	23.28 (0.196)
BART	Average number of pumps	0.29 (0.769)	0.34 (0.725)	0.06 (0.955)
	Critical response time (ms)	8.63 (0.317)	18.17 * (0.037)	9.54 (0.269)
Stroop	Final response time (ms)	14.07 (0.614)	49.89 (0.077)	35.81 (0.202)
	ACC _{total} (%)	0.71 (0.218)	0.58 (0.309)	−0.13 (0.827)
	CRT _{total} (ms)	1.90 (0.735)	6.48 (0.250)	4.58 (0.415)
	ACC _{con} (%)	0.25 (0.765)	0.83 (0.321)	0.58 (0.487)
	CRT _{con} (ms)	1.81 (0.767)	12.37 * (0.046)	10.57 (0.087)
	ACC _{incon} (%)	1.17 (0.139)	0.33 (0.671)	−0.83 (0.289)
	CRT _{incon} (ms)	2.10 (0.716)	0.89 (0.878)	−1.22 (0.833)

Bolded numbers indicate statistically significant differences; * ($p < 0.05$), ** ($p < 0.01$).

Table S2. Values of the cognitive test performance metrics.

Cognitive Tests	Performance Metrics (Unit)	Values		
		Low CO ₂ (Mean ± SD)	Medium CO ₂ (Mean ± SD)	High CO ₂ (Mean ± SD)
Simple RT	ACC_{sim} (%)	100.0 ± 0.0	99.5 ± 2.6	99.8 ± 0.9
	CRT_{sim} (ms)	326.7 ± 36.6	333.7 ± 56.0	323.5 ± 35.9
Discriminative RT	ACC_{dis} (%)	96.8 ± 5.1	97.3 ± 3.9	98.3 ± 3.2
	CRT_{dis} (ms)	424.3 ± 66.9	438.8 ± 74.0	424.7 ± 72.3
Choice RT	ACC_{cho} (%)	94.9 ± 7.0	96.0 ± 5.5	95.9 ± 5.0
	CRT_{cho} (ms)	491.5 ± 40.5	504.4 ± 68.9	510.1 ± 58.0
Speed perception	Deviation rate (%)	12.13 ± 1.94	12.10 ± 1.85	11.97 ± 1.53
	ACC_{total} (%)	98.2 ± 2.4	97.3 ± 3.4	97.9 ± 2.6
	CRT_{total} (ms)	1629.5 ± 338.6	1690.0 ± 233.5	1744.9 ± 287.1
VS	ACC_{report} (%)	96.8 ± 4.8	95.5 ± 5.5	96.7 ± 5.3
	CRT_{report} (ms)	1175.4 ± 230.2	1140.7 ± 172.3	1253.4 ± 213.1
	False alert rate (%)	0.5 ± 1.5	1.0 ± 3.1	0.8 ± 1.9
2-back	Missing report rate (%)	3.2 ± 4.8	4.5 ± 5.5	3.3 ± 5.3
	ACC (%)	97.2 ± 3.7	98.0 ± 2.3	97.1 ± 2.9
	CRT (ms)	663.1 ± 147.8	651.8 ± 173.9	675.0 ± 184.8
BART	Average number of pumps	51.2 ± 5.7	51.5 ± 7.0	51.5 ± 4.9
	Critical response time (ms)	278.5 ± 69.8	287.2 ± 62.4	296.7 ± 73.0
	Final response time (ms)	625.8 ± 221.9	639.9 ± 235.6	675.7 ± 244.4
Stroop	ACC_{total} (%)	96.4 ± 3.4	97.1 ± 3.3	97.0 ± 2.8
	CRT_{total} (ms)	386.4 ± 27.2	388.3 ± 31.9	392.9 ± 39.2
	ACC_{con} (%)	96.7 ± 3.6	96.6 ± 4.2	97.5 ± 3.0
	CRT_{con} (ms)	383.3 ± 26.3	385.1 ± 31.4	395.6 ± 43.0
	ACC_{incon} (%)	96.1 ± 3.9	97.3 ± 4.0	96.4 ± 4.0
	CRT_{incon} (ms)	390.7 ± 29.5	392.8 ± 33.8	391.6 ± 37.7