

Zero gravity induced by parabolic flight enhances automatic capture and weakens voluntary maintenance of visuospatial attention

Supplementary Results and Note

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Supplementary Table 1. Individual data for the Exogenous and the Endogenous tasks.

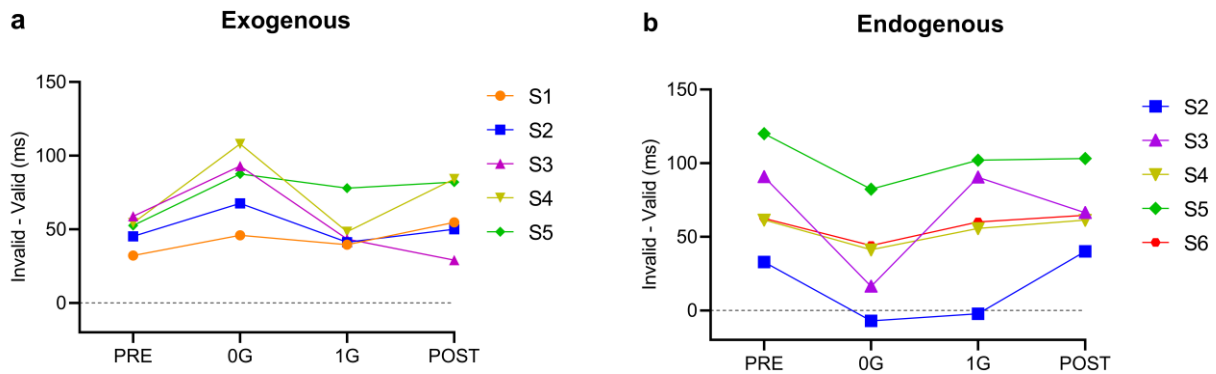
EXOGENOUS

		PRE		0G		1G		POST	
		VALID	INVALID	VALID	INVALID	VALID	INVALID	VALID	INVALID
S1_ BK	RT (ms)	417.7 ± 92.7	449.8 ± 105.2	337.1 ± 123.7	383.0 ± 60.2	425.6 ± 131.1	465.1 ± 136.1	384.2 ± 61.7	439.0 ± 42.8
	Acc (%)	100	100	100	90	100	97.5	100	97.5
	Outliers	1	0	0	0	0	0	0	0
S2	RT (ms)	313.4 ± 59.6	358.7 ± 44.7	310.0 ± 84.5	377.7 ± 76.9	295.6 ± 46.8	336.9 ± 46.6	311.4 ± 56.2	361.5 ± 42.2
	Acc (%)	100	87.5	100	100	100	100	100	100
	Outliers	0	0	0	1	0	0	0	0
S3	RT (ms)	364.3 ± 65.4	423.3 ± 65.3	334.5 ± 152.1	427.5 ± 145.0	398.2 ± 69.0	441 ± 72.7	373.6 ± 87.1	402.7 ± 67.8
	Acc (%)	95	100	100	92.5	95	97.5	95	97.5
	Outliers	0	0	0	0	0	0	0	0
S4	RT (ms)	321.4 ± 61.9	375.7 ± 83.3	264.5 ± 75.0	372.4 ± 83.4	315.1 ± 101.1	363.5 ± 79.7	354.8 ± 144.3	438.9 ± 146.1
	Acc (%)	100	92.5	100	82.5	97.5	95	97.5	95
	Outliers	0	0	0	0	0	0	0	0
S5	RT (ms)	260.2 ± 73.7	313.4 ± 43.5	229.5 ± 66.5	317.1 ± 60.2	260.1 ± 103.8	338.1 ± 57.6	298.8 ± 85.6	380.9 ± 67.2
	Acc (%)	92.5	65	97.5	67.5	97.5	75	97.5	74
	Outliers	4	3	1	1	0	2	1	0
Mean	RT (ms)	335.5 ± 58.8	384.2 ± 53.7	295.1 ± 46.8	375.5 ± 39.2	338.9 ± 70.1	389.0 ± 60.2	344.6 ± 37.7	404.6 ± 34.6
	Acc (%)	97.5	89	99.5	86.5	98	93	99	92.5
Sum	Outliers	5	3	1	2	0	2	1	0

ENDOGENOUS

		PRE		0G		1G		POST	
		VALID	INVALID	VALID	INVALID	VALID	INVALID	VALID	INVALID
S2	RT (ms)	263.5 ± 52.2	296.4 ± 47.1	265.1 ± 49.7	258.1 ± 55.5	250.5 ± 49.7	248.2 ± 35.9	237.4 ± 50.4	277.6 ± 41.2
	Acc (%)	96	100	96	100	96	95	96	95
	Outliers	1	0	0	0	0	0	0	1
S3	RT (ms)	259.5 ± 51.3	350.2 ± 94.0	293.4 ± 124.4	309.8 ± 84.6	261.3 ± 69.1	351.6 ± 79.3	264.4 ± 54.8	330.2 ± 47.9
	Acc (%)	100	90	100	100	96	85	96	90
	Outliers	0	0	0	0	0	0	0	0
S4	RT (ms)	272.8 ± 79.2	334.3 ± 72.4	270.8 ± 87.4	312.1 ± 110.1	301.1 ± 123.5	356.8 ± 106.9	283.4 ± 87.1	344.7 ± 122.6
	Acc (%)	100	95	98	75	98	90	100	80
	Outliers	1	0	1	2	3	3	0	0
S5	RT (ms)	245.2 ± 132.6	365.1 ± 216.9	223.8 ± 101.7	306.2 ± 162.1	216.0 ± 56.9	318.1 ± 204.1	233.0 ± 122.4	336.2 ± 93.2
	Acc (%)	100	85	94	85	94	75	100	60
	Outliers	1	2	1	1	9	2	9	4
S6	RT (ms)	337.8 ± 96.1	400.3 ± 106.0	337.2 ± 96.1	381.3 ± 93.5	325.3 ± 88.6	385.4 ± 139.4	298.3 ± 81.8	362.9 ± 135.2
	Acc (%)	100	100	100	100	100	100	100	95
	Outliers	0	0	0	1	0	0	1	1
Mean	RT (ms)	275.7 ± 36.0	349.3 ± 38.3	278 ± 41.5	313.5 ± 43.9	270.8 ± 42.9	332.0 ± 52.5	263.2 ± 28.3	330.3 ± 31.9
	Acc (%)	99.2	94	97.6	92	96.8	89	98.4	84
Sum	Outliers	3	2	2	4	12	5	10	6

Legend: Reaction Times (RTs ± SD), Accuracy (Acc in %), and number of Outliers are reported for each experimental condition.



Supplementary Figure 1. Individual data of the validity effect (RTs for Invalid-Valid) for the Exogenous (a) and Endogenous (b) tasks across conditions.

Supplementary Note

As recently shown by neuroimaging studies, the human brain undergoes functional and structural neuroplastic changes after long-term periods of simulated (1-4) and real (5-10) microgravity. Neuroplastic brain changes are thought to occur as adaptive response to altered sensorimotor functioning (e.g., vestibular and proprioception senses and motor control), but also to brain unloading and fluids shift. While structural brain changes need time to occur, functional brain changes have also been reported during PF periods of weightlessness (11, 12) and following PF (13). PF functional changes, as measured by ERP signals (11) during PF or fMRI after PF (13), seem to mainly involve areas belonging to attentional networks, i.e. the right Supramarginal Gyrus, a structure belonging to TPJ (13). We may speculate that our findings might represent one of the behavioural correlates of PF functional changes. Future studies, concurrently collecting behavioural and neuroimaging measures, are necessary to unequivocally establish the neural bases of the observed cognitive effects.

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