SUPPLEMENTARY INFORMATION

Transcranial direct current stimulation of the medial prefrontal cortex dampens mind-wandering in men

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Supplementary Table S1. Percentage of different contents of mind-wandering before and after tDCS

		Past			Present			Future			Distractions			Time not-clear			Unaware			Self			Other			None		
		Before	After	*Δ*	Before	After	*Δ*	Before	After	*Δ*	Before	After	*Δ*	Before	After	*Δ*	Before	After	*Δ*	Before	After	*Δ*	Before	After	*Δ*	Before	After	*Δ*
F	mPFC	8.6	11.0	2.4	19.7	22.1	2.4	25.6	22.7	-3.0	26.5	18.1	-8.3	16.2	21.9	5.7	3.3	4.2	0.8	43.7	44.3	0.6	38.5	42.0	3.5	14.4	9.5	-4.9
		(2.5)	(4.2)	(4.5)	(4.0)	(4.5)	(4.7)	(4.7)	(5.3)	(5.0)	(6.1)	(6.7)	(4.1)	(6.0)	(4.8)	(4.0)	(1.9)	(1.9)	(1.9)	(6.4)	(5.3)	(7.6)	(4.1)	(5.4)	(8.1)	(4.4)	(4.0)	(3.5)
	occipital	13.3	7.5	-5.8	28.3	23.3	-5.0	15.8	26.7	10.8	18.3	13.3	-5.0	16.7	17.5	0.8	7.5	11.7	4.2	35.8	40.8	5.0	25.8	24.2	-1.7	30.8	23.3	-7.5
		(4.3)	(3.5)	(3.4)	(4.9)	(4.8)	(6.9)	(3.1)	(5.3)	(5.1)	(3.7)	(3.6)	(4.8)	(4.5)	(3.0)	(4.0)	(2.2)	(4.4)	(4.0)	(4.8)	(8.0)	(8.1)	(4.2)	(3.6)	(3.4)	(6.0)	(4.7)	(5.4)
	sham	16.8	17.2	0.4	19.1	14.5	-4.6	28.6	33.2	4.5	15.9	11.8	-4.2	17.9	17.5	-0.4	1.7	5.9	4.3	35.6	32.7	-2.9	49.8	44.2	-5.6	12.9	17.2	4.3
		(3.4)	(3.7)	(5.7)	(6.0)	(3.4)	(6.3)	(4.9)	(5.1)	(5.2)	(4.3)	(3.4)	(4.3)	(4.6)	(3.6)	(4.5)	(1.1)	(2.6)	(2.0)	(5.5)	(4.2)	(4.5)	(4.8)	(6.1)	(6.4)	(3.2)	(4.4)	(5.7)
M	mPFC	14.4	10.9	-3.4	30.4	22.9	-7.5	24.5	21.0	-3.4	12.7	9.4	-3.3	12.9	25.3	12.4	5.2	10.6	5.4	43.6	43.3	-0.3	31.2	24.5	-6.7	20.0	21.6	1.6
		(4.7)	(4.0)	(3.6)	(5.4)	(6.3)	(7.1)	(4.9)	(6.6)	(4.2)	(2.8)	(2.7)	(3.2)	(3.1)	(5.0)	(4.6)	(2.4)	(5.6)	(6.0)	(3.7)	(8.7)	(7.4)	(3.6)	(4.7)	(4.1)	(4.4)	(6.1)	(5.3)
	occipital	10.7	8.1	-2.6	31.7	12.8	-19.0	14.6	23.1	8.4	27.4	28.9	1.5	12.2	25.6	13.3	3.3	1.7	-1.7	34.7	25.4	-9.3	37.1	40.0	2.9	24.9	32.9	8.0
		(4.5)	(3.1)	(5.7)	(6.0)	(4.2)	(7.9)	(5.1)	(7.0)	(7.9)	(4.8)	(10.5)	(8.5)	(4.0)	(7.9)	(8.2)	(1.4)	(1.7)	(1.7)	(4.3)	(8.2)	(7.2)	(5.7)	(9.8)	(8.6)	(6.2)	(8.1)	(5.2)
	sham	11.8	14.3	2.5	16.2	10.9	-5.3	22.9	25.4	2.5	23.4	19.3	-4.1	20.6	21.9	1.2	5.1	8.3	3.2	25.6	34.4	8.8	42.8	18.7	-24.1	26.4	38.5	12.1
		(5.5)	(4.0)	(5.8)	(3.6)	(2.9)	(3.8)	(4.3)	(5.0)	(6.1)	(6.2)	(4.3)	(3.5)	(5.6)	(4.6)	(4.4)	(1.5)	(3.0)	(2.3)	(5.5)	(5.8)	(5.1)	(6.1)	(3.9)	(6.2)	(7.2)	(7.4)	(8.0)

Note. F = females; M = males; mPFC = cathodal stimulation of medial prefrontal cortex; Occipital = cathodal stimulation of occipital cortex; *Δ* = difference between pre- and post-tDCS. In parenthesis we report the standard errors of the mean. To investigate whether tDCS over mPFC modulated the content of mind-wandering, we first counted the number of times participants described the contents of their thoughts as belonging to different categories (past, present, future, current distractions, time not clear, unaware, self-related, other-related, and unrelated to people). We then computed the ratio between the number of thoughts for each content category and the total number of mind-wandering episodes claimed (trials receiving a VAS rating > 0), thus obtaining an index of the 'quality' of mind-wandering independent of quantity, separately for the pre- and post-tDCS sessions, which we report, for space reasons, as percentages. We first verified whether there were group differences in the contents of mind-wandering before tDCS. A Kruskal-

Wallis ANOVA on the frequency of other-related thoughts with Group as factor (mPFC-men, mPFC-women, occipital-men, occipital-women, sham-men, sham-women) revealed an effect of group ($H = 12.01$, $p = 0.03$). There were no significant group differences in the other content categories ($H < 8.73$, $p > 0.12$ in all cases). We followed-up the effect of group running separate Kruskal-Wallis ANOVAs in men and women. In women, the ANOVA detected a significant effect of stimulation ($H = 8.54$, $p = 0.01$), such that the sham group experienced a higher proportion of other-related thoughts than the occipital group before tDCS (0.498 vs. 0.258, $z = 2.77$, $p = 0.005$). In men, the same ANOVA detected no significant difference among stimulation groups ($H = 2.71$, $p = 0.26$). Next, we calculated Δ-scores as content ratio after the stimulation – content ratio before the stimulation, for each content category and each participant. A Kruskal-Wallis ANOVA on Δ-scores for other-related thoughts with Group as factor (mPFC-men, mPFC-women, occipital-men, occipital-women, sham-men, sham-women) revealed an effect of group ($H = 12.30$, $p = 0.03$), while group differences in Δ-scores for the other content categories were not significant ($H < 7.22$, $p > 0.20$ in all cases). A Kruskal-Wallis ANOVAs on Δ-scores for other-related thoughts in men showed a significant effect of stimulation group ($H = 7.86$, $p = 0.02$), with a higher Δ_{OTHER} in the mPFC group (-0.067 vs. -0.241, $z = 2.11$, $p = 0.03$) and in the occipital group compared to the sham group (0.029 vs. -0.241, $z = 2.42$, $p = 0.01$), but no difference between the mPFC and the occipital group ($p = 0.22$). We note that in the sham group the decrease in other-related thoughts in the post- (compared to the pre-) tDCS session (before: 0.428 vs. after: 0.187, Wilcoxon test $z = 2.85$, $p = 0.004$) came along with a marginal increase in self-related thoughts (before: 0.256 vs. after: 0.344, Wilcoxon test: $z = 1.75$, $p = 0.08$), not observed in the mPFC group and in the occipital groups ($p > 0.27$ in both cases). The same ANOVA in women yielded no significant difference among stimulation groups ($H = 1.48$, $p = 0.48$). Thus, in men, mind-wandering became less other-related (and relatively more self-related) with time (sham condition), and this shift towards self-relatedness was significantly reduced by active tDCS (either to mPFC or the occipital cortex).