Optimizing the effect of tDCS on motor sequence learning in the elderly

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Supplementary materials:

Results of post-hoc comparisons of blocks as well as block and condition interactions are listed in the tables below:

Table S1. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the absolute reaction time of M-SRTT under all stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	1 (Random)	2 (Sequence)	3.142	23	0.641	0.005*
		3 (Sequence)	1.203	23	0.246	0.241
		4 (Sequence)	1.067	23	0.218	0.297
		5 (Sequence)	2.657	23	0.542	0.014*
		6 (Random)	-1.040	23	-0.212	0.309
		7 (Sequence)	1.164	23	0.238	0.256
		8 (Sequence)	1.078	23	0.220	0.292

2 mA	1	2	2.711	23	0.553	0.012*
		3	4.162	23	0.849	<0.001*
		4	2.469	23	0.504	0.021*
		5	2.900	23	0.592	0.008*
		6	-1.320	23	-0.269	0.200
		7	3.100	23	0.633	0.005*
		8	3.334	23	0.680	0.003*
3 mA	1	2	3.487	23	0.712	0.002*
		3	2.422	23	0.494	0.024*
		4	2.693	23	0.550	0.013*
		5	1.468	23	0.300	0.156
		6	-1.446	23	-0.295	0.162
		7	1.134	23	0.231	0.269
		8	2.211	23	0.451	0.037*
Sham	1	2	3.376	23	0.689	0.003*
		3	2.438	23	0.498	0.023*
		4	2.223	23	0.454	0.036*
		5	3.541	23	0.723	0.002*
		6	-1.079	23	-0.220	0.292
		7	1.447	23	0.295	0.161
		8	2.183	23	0.446	0.039*

Table S2. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the absolute reaction time of M-SRTT between block 6 (random block) to block 5 and 7 (sequence) under stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	6 (Random)	5 (Sequence)	4.864	23	0.993	<0.001*
		7 (Sequence)	3.913	23	0.799	0.001*
2 mA	6	5	6.179	23	1.261	<0.001*
		7	6.784	23	1.385	<0.001*
3 mA	6	5	4.090	23	0.835	<0.001*
		7	3.211	23	0.655	0.004*
Sham	6	5	5.909	23	1.206	<0.001*

		7	3.148	23	0.643	0.005*

Table S3. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the normalised reaction time of M-SRTT under all stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	1 (Random)	2 (Sequence)	3.105	23	0.634	0.005*
		3 (Sequence)	1.555	23	0.318	0.133
		4 (Sequence)	1.412	23	0.288	0.171
		5 (Sequence)	2.709	23	0.553	0.013*
		6 (Random)	-1.225	23	-0.250	0.233
		7 (Sequence)	1.169	23	0.239	0.255
		8 (Sequence)	1.263	23	0.258	0.219
2 mA	1	2	2.917	23	0.596	0.008*
		3	4.283	23	0.874	<0.001*
		4	2.627	23	0.536	0.015*
		5	3.030	23	0.619	0.006*
		6	-1.335	23	-0.273	0.195
		7	3.291	23	0.672	0.003*
		8	3.455	23	0.705	0.002*
3 mA	1	2	3.752	23	0.766	0.001*
		3	2.627	23	0.536	0.015*
		4	2.850	23	0.582	0.009*
		5	1.622	23	0.331	0.119
		6	-1.625	23	-0.332	0.118
		7	1.179	23	0.241	0.250
		8	2.245	23	0.458	0.035*
Sham	1	2	3.354	23	0.685	0.003*
		3	2.576	23	0.526	0.017*
		4	2.489	23	0.508	0.021*
		5	3.709	23	0.757	0.001*
		6	-1.156	23	-0.236	0.259
		7	1.687	23	0.344	0.105
		8	2.423	23	0.495	0.024*

Table S4. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the normalised reaction time of M-SRTT between block 6 (random block) to block 5 and 7 (sequence) under stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	6 (Random)	5 (Sequence)	5.117	23	1.044	<0.001*
		7 (Sequence)	4.300	23	0.878	<0.001*
2 mA	6	5	6.204	23	1.266	<0.001*
		7	6.156	23	1.257	<0.001*
3 mA	6	5	4.296	23	0.877	<0.001*
		7	3.696	23	0.754	0.001*
Sham	6	5	6.474	23	1.321	<0.001*
		7	3.365	23	0.687	0.003*

Table S5. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the errors of M-SRTT under all stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	1 (Random)	2 (Sequence)	-0.748	23	-0.153	0.462
		3 (Sequence)	-0.684	23	-0.140	0.501
		4 (Sequence)	-0.387	23	-0.079	0.702
		5 (Sequence)	0.164	23	0.033	0.872
		6 (Random)	-0.328	23	-0.067	0.746
		7 (Sequence)	-0.144	23	-0.029	0.887
		8 (Sequence)	-0.352	23	-0.072	0.728
2 mA	1	2	0.666	23	0.136	0.512
		3	1.934	23	0.395	0.066
		4	0.914	23	0.186	0.370
		5	1.206	23	0.246	0.240
		6	-0.115	23	-0.023	0.909
		7	0.800	23	0.163	0.432

		8	0.807	23	0.165	0.428
3 mA	1	2	1.319	23	0.269	0.200
		3	2.320	23	0.474	0.030*
		4	1.404	23	0.287	0.174
		5	2.491	23	0.509	0.020*
		6	2.048	23	0.418	0.052
		7	1.160	23	0.237	0.258
		8	1.026	23	0.209	0.315
Sham	1	2	-0.735	23	-0.150	0.470
		3	-0.497	23	-0.101	0.624
		4	-0.343	23	-0.070	0.735
		5	-0.659	23	-0.135	0.516
		6	-1.905	23	-0.389	0.069
		7	0.387	23	0.079	0.702
		8	0.617	23	0.126	0.544

Table S6. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the errors of M-SRTT between block 6 (random block) to block 5 and 7 (sequence) under stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	6 (Random)	5 (Sequence)	0.569	23	0.116	0.575
		7 (Sequence)	0.177	23	0.036	0.861
2 mA	6	5	1.797	23	0.367	0.085
		7	1.357	23	0.277	0.188
3 mA	6	5	0.000	23	0.000	1.000
		7	-1.101	23	-0.225	0.282
Sham	6	5	2.488	23	0.508	0.021*
		7	2.875	23	0.587	0.009*

Table S7. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the variability of absolute reaction time of M-SRTT under all stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	1 (Random)	2 (Sequence)	0.818	23	0.167	0.422
		3 (Sequence)	-2.015	23	-0.411	0.056
		4 (Sequence)	-2.280	23	-0.465	0.032*
		5 (Sequence)	-1.652	23	-0.337	0.112
		6 (Random)	-3.548	23	-0.724	0.002*
		7 (Sequence)	-2.189	23	-0.447	0.039*
		8 (Sequence)	-3.223	23	-0.658	0.004*
2 mA	1	2	-0.665	23	-0.136	0.513
		3	-0.690	23	-0.141	0.497
		4	-2.771	23	-0.566	0.011*
		5	-1.490	23	-0.304	0.150
		6	-3.388	23	-0.962	0.003*
		7	-2.611	23	-0.533	0.016*
		8	-2.415	23	-0.493	0.024*
3 mA	1	2	-0.393	23	-0.080	0.698
		3	-2.464	23	-0.503	0.022*
		4	-3.011	23	-0.615	0.006*
		5	-2.749	23	-0.561	0.011*
		6	-3.077	23	-0.628	0.005*
		7	-3.835	23	-0.783	<0.001*
		8	-4.552	23	-0.929	<0.001*
Sham	1	2	0.053	23	0.11	0.958
		3	-2.258	23	-0.461	0.034*
		4	-2.172	23	-0.443	0.040*
		5	-2.438	23	-0.498	0.023*
		6	-2.581	23	-0.527	0.017*
		7	-3.202	23	-0.654	0.004*
		8	-3.580	23	-0.731	0.002*

Table S8. Post-hoc results of M-SRTT. Results of post-hoc pairwise comparisons of the variability of absolute reaction time of M-SRTT between block 6 (random block) to block 5 and 7 (sequence) under stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	6 (Random)	5 (Sequence)	1.503	23	0.307	0.146
		7 (Sequence)	0.820	23	0.167	0.420
2 mA	6	5	2.211	23	0.451	0.037*
		7	0.925	23	0.189	0.365
3 mA	6	5	0.409	23	0.084	0.686
		7	-0.380	23	-0.077	0.708
Sham	6	5	1.442	23	0.294	0.163
		7	-0.259	23	-0.053	0.798

Table S9. Post-hoc results of R-SRTT. Results of post-hoc pairwise comparisons of the absolute reaction time of R-SRTT under all stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	df	Effect size d	*P* value
1 mA	1 (Random)	2 (Sequence)	5.402	23	1.103	<0.001*
		3 (Sequence)	4.727	23	0.965	<0.001*
2 mA	1	2	5.728	23	1.169	<0.001*
		3	4.805	23	0.981	<0.001*
3 mA	1	2	5.110	23	1.043	<0.001*
		3	3.595	23	0.734	0.002*
Sham	1	2	7.231	23	1.476	<0.001*
		3	5.707	23	1.165	<0.001*

Table S10. Post-hoc results of R-SRTT. Results of post-hoc pairwise comparisons of the normalised reaction time of R-SRTT under all stimulation conditions are shown. Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	1 (Random)	2 (Sequence)	5.540	23	1.131	<0.001*
		3 (Sequence)	4.500	23	0.918	<0.001*
2 mA	1	2	6.040	23	1.233	<0.001*
		3	5.092	23	1.039	<0.001*

3 mA	1	2	5.591	23	1.141	<0.001*
		3	3.519	23	0.718	<0.001*
Sham	1	2	7.049	23	1.439	<0.001*
		3	5.831	23	1.190	<0.001*

Table S11. Post-hoc results of R-SRTT. Results of post-hoc pairwise comparisons of the variability of absolute reaction time of the R-SRTT under all stimulation conditions are shown). Asterisks indicate significant results ($p<0.05$).

Condition	Block	Blocks	*t* value	d.f.	Effect size d	*P* value
1 mA	1 (Random)	2 (Sequence)	-1.885	23	-0.385	0.072
		3 (Sequence)	-4.717	23	-0.963	<0.001*
	2 (Sequence)	3 (Sequence)	-3.352	23	-0.684	0.003*
2 mA	1	2	0.416	23	0.085	0.681
		3	0.317	23	0.065	0.754
	2	3	-0.249	23	-0.051	0.806
3 mA	1	2	1.018	23	0.208	0.319
		3	-1.459	23	-0.298	0.158
	2	3	-2.569	23	-0.524	0.017*
Sham	1	2	-0.056	23	-0.011	0.956
		3	-2.172	23	-0.443	0.040*
	2	3	-2.687	23	-0.549	0.013*

Table S12. Post-hoc results of R-SRTT. Results of post-hoc pairwise comparisons of the block × condition interaction for the variability of absolute reaction time of the R-SRTT are shown. Asterisks indicate significant results ($p<0.05$).

Block	intensity	intensity	*t* value	d.f.	Effect size d	*P* value
1 (Random)	Sham	1mA	0.902	23	0.184	0.376
		2mA	-0.190	23	-0.039	0.851
		3mA	-0.257	23	-0.052	0.800
	1mA	2mA	0.546	23	0.111	0.590

		3mA	1.207	23	0.246	0.240
	2mA	3mA	-0.442	23	-0.090	0.663
2 (Sequence)	Sham	1mA	-0.203	23	-0.041	0.841
		2mA	0.501	23	0.102	0.621
		3mA	0.456	23	0.093	0.652
	1mA	2mA	-0.728	23	-0.149	0.474
		3mA	-0.944	23	-0.193	0.355
	2mA	3mA	0.003	23	0.001	0.998
3 (Sequence)	Sham	1mA	-0.461	23	-0.094	0.649
		2mA	-2.288	23	-0.467	0.032*
		3mA	0.125	23	0.025	0.902
	1mA	2mA	-2.450	23	-0.500	0.022*
		3mA	-0.462	23	-0.094	0.648
	2mA	3mA	-2.497	23	-0.510	0.020*