Supplementary Material

Effects of 6-Month Combined Physical Exercise and Cognitive Training on Neuropsychological and Neurophysiological Function in Older Adults with Subjective Cognitive Decline: A Randomized Controlled Trial

Supplementary Table 1. Baseline characteristics of the participants who completed the whole program.

	Intervention (n = 22)	Control (n = 13)	p
Age	63.77 ± 1.04	67.62 ± 1.87	0.08
Sex (male/female)	6/16	1/12	0.22
Education	14.45 ± 0.76	11.00 ± 1.04	0.02
*APOE*4 (carrier/non-carrier)	8/14	4/9	1.00
History of hypertension (yes/no) [a]	3/19	4/9	0.38
History of diabetes (yes/no) [a]	2/20	3/10	0.34
CASI	95.05 ± 0.64	91.92 ± 0.86	0.01
MMSE	28.95 ± 0.30	28.08 ± 0.37	0.03
SCD score	4.55 ± 0.47	6.54 ± 1.08	0.15
GDS	1.59 ± 0.31	2.08 ± 0.69	0.85

Data are presented as mean (M) ± standard error of the mean (SEM), unless otherwise specified. *APOE*4, Apolipoprotein E4; CASI, Cognitive Abilities Screening Instrument; MMSE, Mini-Mental State Examination; SCD, subjective cognitive decline; GDS, Geriatric Depression Scale.

[a] All the participants who reported a history of hypertension or diabetes were controlled by medication.

Supplementary Table 2. Changes of Z score in each cognitive test of the primary outcome.

	Intervention (n = 22)	Control (n =13)	p
CVVLT (immediate recall)			
ΔT2–T1	0.058 ± 0.159	−0.067 ± 0.282	0.494
ΔT3–T1	−0.003 ± 0.174	0.018 ± 0.257	0.401
CVVLT (delayed recall)			
ΔT2–T1	0.097 ± 0.162	−0.170 ± 0.296	0.144
ΔT3–T1	−0.052 ± 0.165	−0.001 ± 0.336	0.337
LM (immediate recall)			
ΔT2–T1	0.006 ± 0.162	−0.021 ± 0.320	0.453
ΔT3–T1	0.058 ± 0.203	−0.102 ± 0.248	0.325
LM (delayed recall)			
ΔT2–T1	0.054 ± 0.194	−0.100 ± 0.217	0.313
ΔT3–T1	0.089 ± 0.199	−0.153 ± 0.182	0.115
CFT (immediate recall)			
ΔT2–T1	0.053 ± 0.219	−0.083 ± 0.187	0.453
ΔT3–T1	−0.002 ± 0.229	0.004 ± 0.291	0.375
CFT (delayed recall)			
ΔT2–T1	0.157 ± 0.202	−0.274 ± 0.189	0.136
ΔT3–T1	0.096 ± 0.217	−0.165 ± 0.224	0.227
DSB			
ΔT2–T1	0.114 ± 0.138	−0.226 ± 0.290	0.177
ΔT3–T1	0.058 ± 0.205	−0.110 ± 0.260	0.195
TMT–B			
ΔT2–T1	0.052 ± 0.147	−0.085 ± 0.209	0.337
ΔT3–T1	0.110 ± 0.151	−0.184 ± 0.154	0.144
CASI			
ΔT2–T1	−0.118 ± 0.126	0.187 ± 0.378	0.401
ΔT3–T1	−0.184 ± 0.242	0.287 ± 0.268	0.090

Data are presented as mean (M) ± standard error of the mean (SEM)

CVVLT, Chinese Version Verbal Learning Test; LM, Logic Memory Test Part A of the Wechsler Memory Scale; CFT, Taylor Complex Figure Test; DSB, Digit Span Backward; TMT-B, Trail-Making Test–B; CASI, Cognitive Abilities Screening Instrument. T1, Baseline, T2, End of the intervention, T3, 6 months after the intervention

Supplementary Table 3. Accuracy rate (%) in the 1-back task

	Intervention (n = 22)	Control (n =13)	p
T1	91.98 ± 2.40	88.36 ± 2.74	0.106
T2	94.80 ± 0.92	93.72 ± 1.18	0.333
T3	93.30 ± 2.10	95.34 ± 1.02	0.900

Data are presented as mean (M) ± standard error of the mean (SEM)

T1, Baseline, T2, End of the intervention, T3, 6 months after the intervention

Supplementary Table 4. Accuracy rate (%) in the Go-Nogo task

	Intervention (n = 22)	Control (n =13)	p
T1			
Go trials	99.59 ± 0.14	99.61 ± 0.19	0.740
Nogo trials	78.74 ± 3.52	84.77 ± 2.45	0.435
T2			
Go trials	99.52 ± 0.18	99.59 ± 0.21	0.653
Nogo trials	85.24 ± 2.67	87.13 ± 2.60	0.986
T3			
Go trials	99.76 ± 0.11	99.89 ± 0.05	0.824
Nogo trials	83.83 ± 4.65	85.38 ± 2.50	0.445

Data are presented as mean (M) ± standard error of the mean (SEM)

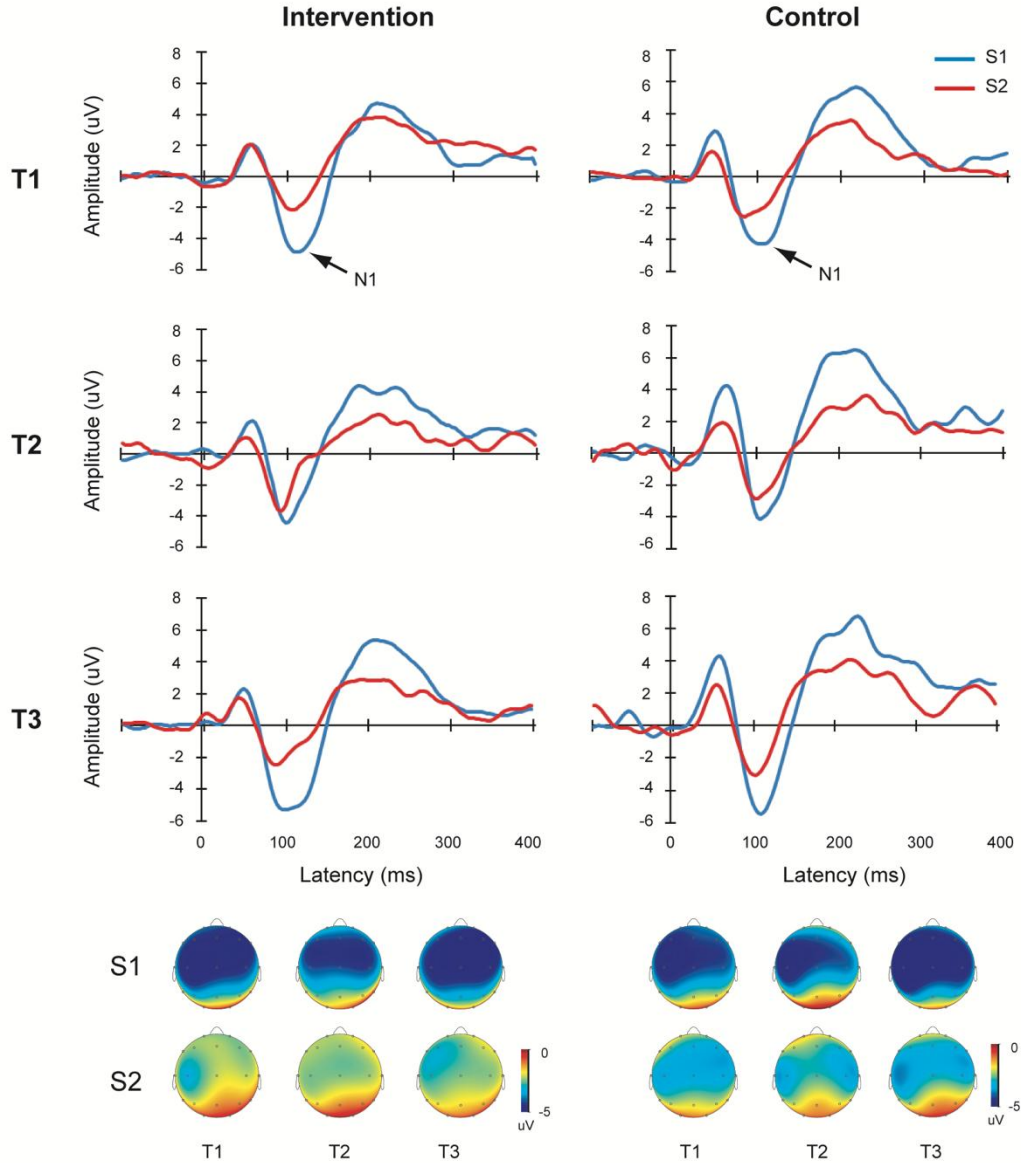T1, Baseline, T2, End of the intervention, T3, 6 months after the intervention

Supplemenatary Table 5. The primary and secondary outcomes following intention-to-treat analysis.

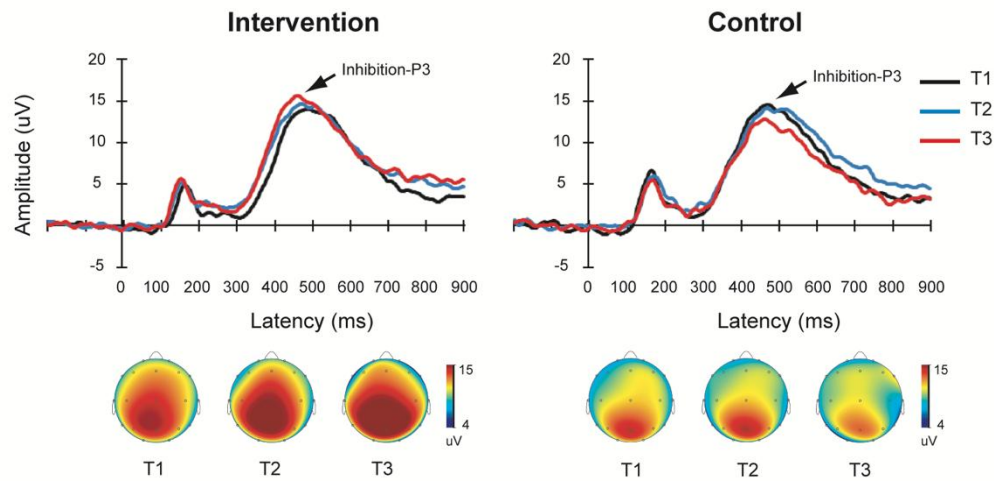|	Intervention (n = 33)	Control (n = 17)	p
Primary outcome			
Cognition (composite Z score)			
ΔT2–T1	0.02 ± 0.07	−0.03 ± 0.14	0.415
ΔT3–T1	−0.01 ± 0.10	0.03 ± 0.13	0.273
Secondary outcomes			
MMN amplitude (uV)			
ΔT2–T1	−0.44 ± 0.25	0.30 ± 0.39	0.062
ΔT3–T1	0.02 ± 0.23	−0.08 ± 0.41	0.425
MMN latency (ms)			
ΔT2–T1	−20.94 ± 12.45	11.37 ± 16.26	0.015*
ΔT3–T1	−9.79 ± 8.93	0 ± 16.69	0.442
Memory-P3 amplitude (uV)			
ΔT2–T1	−0.04 ± 0.65	0.36 ± 0.75	0.217
ΔT3–T1	0 ± 0.61	0.72 ± 0.64	0.237
Memory-P3 latency (ms)			
ΔT2–T1	6.25 ± 23.42	12.75 ± 15.86	0.220
ΔT3–T1	−25.10 ± 19.33	4.71 ± 14.47	0.048*
SG			
ΔT2–T1	0.20 ± 0.45	0.35 ± 0.93	0.442
ΔT3–T1	−0.41 ± 0.59	−0.41 ± 0.67	0.475
Inhibition-P3 amplitude (uV)			
ΔT2–T1	0.48 ± 0.54	0.07 ± 1.22	0.243
ΔT3–T1	1.03 ± 0.46	−0.67 ± 1.58	0.264
Inhibition-P3 latency (ms)			
ΔT2–T1	10.31 ± 14.77	54.12 ± 30.29	0.053
ΔT3–T1	4.27 ± 14.29	48.24 ± 32.34	0.146

Data are presented as mean (M) ± standard error of the mean (SEM)

MMN, Mismatch negativity; SG, Sensory gating; T1, Baseline; T2, End of the intervention; T3, 6 months after the intervention

*$p < 0.05$.

Supplementary Figure 1. Grand-averaged event-related potentials to the first stimulus (S1) and the second stimulus (S2) during an auditory paired-stimulus paradigm in the intervention (n = 21) and control (n = 13) groups. The measurements were performed at the baseline (T1), the end of the intervention (T2), and 6 months after the end of the intervention (T3). Since the N1 component is the largest response to auditory stimuli and can be identified in every subject, the amplitude differences in N1 component between S1 and S2 (i.e., S1–S2) is calculated to reflect sensory gating (SG) ability. The topographic maps of peak N1 latencies at T1, T2, and T3 in each group are also illustrated.

Supplementary Figure 2. Grand-averaged waveforms of P3 responses to the successful Nogo trials (i.e., inhibition-P3) during a Go-Nogo task at Pz electrode in the intervention (n = 21) and control (n = 13) groups. The black, blue, and red traces indicate inhibition-P3 activities at the baseline (T1), the end of the intervention (T2), and 6 months after the end of the intervention (T3), respectively. The topographic maps of peak inhibition-P3 latencies at T1, T2, and T3 in each group are also illustrated.