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Physical activity and cognitive function in mild cognitive impairment

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Table S1. Correlation of cognitive function with age and education

Cognitive function	Age (years)	Education (years)
Memory task		
CASI-Short-term memory	-0.125	0.194
CVVLT-30 sec (immediate free recalls)	-0.166	0.166
CVVLT-10 min (delayed free recalls)	-0.109	-0.013
CVVLT-cued (memory in cued response)	-0.176	0.131
Abstract reasoning		
CASI-Abstraction	-0.230	0.501*
FAB-Similarity (conceptualization)	-0.206	0.587*
Attention		
CASI-Concentration	-0.302*	0.526*
CASI-Attention	-0.138	0.217
Digital Forward Span	-0.236	0.537*
Executive task scores		
TMB (corrected)	-0.101	0.269
Stroop interference test	-0.221	0.179
Calculation	-0.223	0.462*
Visuospatial task scores		
VOSP	-0.121	0.029
Modified ROCF copy	-0.112	0.349*
CASI-Visual construction	-0.094	0.272*
Language ability		
Boston naming test	-0.096	0.661*
CASI-Language ability	-0.279*	0.543*
Semantic category fluency		
CASI-List-generating	-0.265	0.373*
Animal naming	-0.343*	0.455*
Fruit naming	-0.273*	0.190
Transportation naming	-0.106	0.299*
Town naming	-0.301	0.429*

Data present as ρ coefficient. * $p < 0.05$; CASI, Cognitive Abilities Screening Instrument; CVVLT, Chinese version of the Verbal Learning Test (CVVLT-30 sec: free recall after 30 seconds; CVVLT-10 min: free recall after 10 minutes);

FAB-Similarities, similarities (conceptualization) in frontal assessment battery; ROCF, Rey-Osterrieth complex figure; TMB, Trail Making Test B; VOSP, visual object and space perception.

Table S2. Correlation between each measure of activity and each cognitive score

	Direct Correlation between Each Cognitive Score and Each Measure of Activity			Correlation Analysis after Controlling for Age and Sex			Correlation Analysis after Controlling for Age, Sex, and Education		
	A	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
Memory tasks									
CASI-Short-term memory	0.289, 0.034	0.260, 0.058	0.231, 0.093	0.087, 0.559	0.065, 0.664	0.061, 0.685	0.093, 0.540	0.070, 0.644	0.066, 0.665
CVVLT-30 sec	0.183, 0.186	0.155, 0.264	0.130, 0.351	0.186, 0.210	0.119, 0.425	0.143, 0.338	0.166, 0.271	0.097, 0.523	0.122, 0.421
CVVLT-10 min	0.236, 0.085	0.191, 0.167	0.194, 0.159	0.253, 0.086	0.182, 0.220	0.216, 0.145	0.268, 0.072	0.196, 0.192	0.230, 0.124
CVVLT-cued	0.163, 0.238	0.123, 0.375	0.121, 0.382	0.166, 0.264	0.105, 0.484	0.122, 0.412	0.161, 0.284	0.099, 0.515	0.117, 0.439
Abstract reasoning									
CASI-Abstraction	0.252, 0.066	0.225, 0.101	0.292, 0.032	0.212, 0.153	0.118, 0.428	0.204, 0.168	0.162, 0.283	0.060, 0.694	0.155, 0.304
FAB-Similarity	0.182, 0.188	0.181, 0.190	0.220, 0.110	0.137, 0.358	0.082, 0.583	0.103, 0.491	0.059, 0.698	-0.006, 0.968	0.021, 0.890
Attention									
CASI-Concentration	0.161, 0.246	0.132, 0.342	0.236, 0.085	0.145, 0.330	0.070, 0.641	0.142, 0.342	0.100, 0.510	0.019, 0.899	0.097, 0.521
CASI-Attention	0.238, 0.083	0.293, 0.032	0.296, 0.030	0.286, 0.051	0.322, 0.027	0.254, 0.085	0.264, 0.076	0.301, 0.042	0.232, 0.121
Digital Forward Span	-0.023, 0.870	-0.031, 0.824	0.069, 0.622	-0.079, 0.599	-0.133, 0.373	-0.040, 0.789	-0.153, 0.310	-0.213, 0.156	-0.110, 0.467
Executive task scores									
TMB (corrected)	0.327, 0.021	0.330, 0.019	0.379, 0.007	0.216, 0.145	0.224, 0.130	0.307, 0.036	0.197, 0.189	0.205, 0.172	0.291, 0.050
Stroop interference test	0.230, 0.109	0.199, 0.166	0.177, 0.220	0.181, 0.224	0.089, 0.554	0.067, 0.655	0.162, 0.281	0.068, 0.654	0.046, 0.760
Calculation	0.045, 0.744	0.028, 0.842	0.109, 0.433	0.144, 0.334	0.075, 0.616	0.104, 0.485	0.104, 0.494	0.031, 0.840	0.063, 0.679
Visuospatial task scores									
VOSP	-0.102, 0.465	-0.092, 0.507	-0.130, 0.349	-0.069, 0.644	-0.076, 0.612	-0.199, 0.179	-0.045, 0.764	-0.052, 0.731	-0.179, 0.233

	A	B	C
Modified ROCF copy	0.139, 0.170, 0.194, 0.318 0.219 0.159	0.261, 0.239, 0.276, 0.077 0.106 0.061	0.256, 0.234, 0.272, 0.085 0.117 0.068
CASI-Visual construction	0.253, 0.259, 0.225, 0.065 0.059 0.102	0.253, 0.344, 0.368, 0.015 0.018 0.011	0.335, 0.325, 0.350, 0.023 0.027 0.017
Language ability			
Boston naming test	0.113, 0.092, 0.127, 0.414 0.508 0.359	-0.001, 0.002, -0.011, 0.992 0.987, 0.941	-0.093, -0.090, -0.103, 0.537 0.552 0.497
CASI-Language ability	0.079, 0.061, 0.129, 0.569 0.659 0.351	0.075, 0.047, 0.048, 0.616 0.753 0.746	0.023, -0.008, -0.005, 0.881 0.959 0.975
Semantic category fluency			
CASI-List-generating	0.212, 0.219, 0.239, 0.124 0.112 0.081	0.169, 0.086, 0.193, 0.255 0.564 0.195	0.128, 0.040, 0.153, 0.395 0.792 0.309
Animal naming	0.429, 0.395, 0.475, 0.001 0.003 <0.001	0.352, 0.301, 0.375, 0.015 0.040 0.009	0.326, 0.273, 0.350, 0.027 0.067 0.017
Fruit naming	0.329, 0.298, 0.311, 0.015 0.029 0.022	0.318, 0.281, 0.306, 0.029 0.056 0.036	0.273, 0.254, 0.282, 0.067 0.088 0.058
Transportation naming	0.332, 0.323, 0.357, 0.014 0.017 0.008	0.262, 0.287, 0.281, 0.075 0.050 0.056	0.257, 0.284, 0.285, 0.085 0.056 0.055
Town naming	0.302, 0.252, 0.311, 0.026 0.066 0.022	0.330, 0.287, 0.244, 0.023 0.050 0.099	0.300, 0.255, 0.210, 0.043 0.088 0.161

Data present as (ρ, p). A: average step counts per day of 7-day activity; B: average distance (kilometers) per day of 7-day activity; C: average calorie expenditure per day of 7-day activity; CASI, Cognitive Abilities Screening Instrument; CVVLT, Chinese version of the Verbal Learning Test (CVVLT-30 sec: free recall after 30 seconds; CVVLT-10 min: free recall after 10 minutes); FAB-Similarities, similarities (conceptualization) in frontal assessment battery; ROCF, Rey-Osterrieth complex figure; TMB, Trail Making Test B; VOSP, visual object and space perception.

Table S3. Multiple regression between average step counts per day of 7-day activity and cognitive function

Cognitive function	Model 1 [a] (R² = 0.167)	Model 2 [b] (R² = 0.199)
Memory tasks		
CASI-Short-term memory	0.052	0.085
CVVLT-30 sec (immediate free recalls)	0.18	0.196
CVVLT-10 min (delayed free recalls)	0.224	0.272
CVVLT-cued (memory in cued response)	0.157	0.200
Abstract reasoning		
CASI-Abstraction	0.099	0.162
FAB-Similarity (conceptualization)	0.036	0.008
Attention		
CASI-Concentration	-0.005	-0.051
CASI-Attention	0.198	0.200
Digital Forward Span	-0.206	-0.207
Executive task scores		
TMB (corrected)	0.180	0.066
Stroop interference test	0.158	0.129
Calculation	-0.030	-0.034
Visuospatial task scores		
VOSP	-0.076	-0.040
Modified ROCF copy	0.127	0.030
CASI-Visual construction	0.355*	0.192
Language ability		
Boston naming test	-0.047	-0.127
CASI-Language ability	-0.040	0.024
Semantic category fluency		
CASI-List-generating	0.132	0.070
Animal naming	0.262	0.256
Fruit naming	0.214	0.191
Transportation naming	0.108	0.186
Town naming	0.211	0.230

[a] Multiple regression controlled for age and gender. Data present as β coefficient.

Table S4. Multiple regression between average distance (kilometers) per day of 7-day activity and cognitive function

Cognitive function	Model 1 [a] ($R^2 = 0.157$)	Model 2 [b] ($R^2 = 0.177$)
Memory tasks		
CASI-Short-term memory	0.029	0.061
CVVLT-30 sec (immediate free recalls)	0.086	0.119
CVVLT-10 min (delayed free recalls)	0.149	0.194
CVVLT-cued (memory in cued response)	0.091	0.129
Abstract reasoning		
CASI-Abstraction	-0.004	0.053
FAB-Similarity (conceptualization)	-0.022	-0.057
Attention		
CASI-Concentration	-0.089	-0.130
CASI-Attention	0.241	0.245
Digital Forward Span	-0.262	-0.265
Executive task scores		
TMB (corrected)	0.189	0.087
Stroop interference test	0.060	0.030
Calculation	-0.108	-0.105
Visuospatial task scores		
VOSP	-0.082	-0.048
Modified ROCF copy	0.105	0.025
CASI-Visual construction	0.346*	0.195
Language ability		
Boston naming test	-0.042	-0.120
CASI-Language ability	-0.068	-0.008
Semantic category fluency		
CASI-List-generating	0.043	-0.021
Animal naming	0.206	0.202
Fruit naming	0.175	0.157
Transportation naming	0.146	0.221
Town naming	0.165	0.186

[a] Multiple regression controlled for age and gender. Data present as β coefficient.

[*] $p < 0.05$; CASI, Cognitive Abilities Screening Instrument; CVVLT, Chinese version of the Verbal Learning Test (CVVLT-30 sec: free recall after 30 seconds; CVVLT-10 min: free recall after 10 minutes); FAB-Similarities, similarities (conceptualization) in frontal assessment battery; ROCF, Rey-Osterrieth complex figure; TMB, Trail Making Test B; VOSP, visual object and space perception.

Table S5. Multiple regression between average calorie expenditure per day of 7-day activity and cognitive function

Cognitive function	Model 1 [a] (R^2 = 0.224)	Model 2 [b] (R^2 = 0.232)
Memory tasks		
CASI-Short-term memory	-0.098	0.027
CVVLT-30 sec (immediate free recalls)	-0.065	0.095
CVVLT-10 min (delayed free recalls)	0.092	0.196
CVVLT-cued (memory in cued response)	-0.027	0.106
Abstract reasoning		
CASI-Abstraction	0.054	0.046
FAB-Similarity (conceptualization)	-0.010	-0.077
Attention		
CASI-Concentration	0.021	-0.051
CASI-Attention	0.211	0.145
Digital Forward Span	-0.061	-0.224
Executive task scores		
TMB (corrected)	0.213	0.267
Stroop interference test	-0.058	0.021
Calculation	0.039	-0.117
Visuospatial task scores		
VOSP	-0.192	-0.202
Modified ROCF copy	0.259	0.142
CASI-Visual construction	0.274	0.342*
Language ability		
Boston naming test	-0.121	-0.131
CASI-Language ability	-0.048	-0.116
Semantic category fluency		
CASI-List-generating	0.017	0.128
Animal naming	0.392*	0.267
Fruit naming	0.093	0.179
Transportation naming	0.157	0.138
Town naming	0.084	0.078

[a] Multiple regression controlled for age and gender. Data present as β coefficient.