Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Neurological/Psychiatric Conditions Which Excluded Participants.

UK Biobank Field Codes	**Field 6150** = 3
	Field 20001 = 1031 OR 1032
	Field 20002 = 1082 1083 1086 1524 1262 1397 1683 1245 1246 1491 1425 1433 1258 1263 1264 1266 1244 1583 1659 1259 1240 1434
	Fields 41078 and 41142 = F20 – F29
Condition titles	Brain cancer/primary malignant tumour
	Brain haemorrhage
	Brain/intracranial abscess
	Cerebral aneurysm
	Cerebral palsy
	Chronic/degenerative neurological problem
	Dementia/Alzheimer's disease/cognitive impairment
	Encephalitis
	Epilepsy
	Head injury
	Infection of nervous system
	Ischaemic stroke
	Meningeal cancer/malignant meningioma
	Meningioma (benign)
	Meningitis
	Motor neurone disease
	Multiple sclerosis
	Neurological injury/trauma
	Neuroma (benign)
	Other demyelinating condition
	Other neurological problem
	Parkinson's disease
	Psychotic disorders (ICD-10 F20-F29)
	Spina bifida
	Stroke
	Subarachnoid haemorrhage
	Subdural haematoma
	Transient ischaemic attack

eTable 2. Raw Mean Scores (and 95% Range) for Measures of Interest in MDD, BPD and Healthy Control Samples

	MDD (male)	MDD (female)	BPD (male)	BPD (female)	Controls (male)	Controls (female)
Handgrip score (mean average)*	39.1045	23.6902	38.8115	23.1967	39.5639	23.8347
Handgrip score (lower 95% quantile)	20	10	20	9	22	11
Handgrip score (upper 95% quantile)	58	36	57	34	58	36
Visual memory (mean average)	0.4921	0.5132	0.488	0.5213	0.4657	0.5197
Visual memory (lower 95% quantile)	0	0	0	0	0	0
Visual memory (upper 95% quantile)	4	4	4	4	4	4
Number memory (mean average)	6.8349	6.6089	6.6923	6.5106	6.8315	6.5789
Number memory (lower 95% quantile)	4	4	3.85	3	4	4
Number memory (upper 95% quantile)	9	9	9	9	9	9
Reasoning score (mean average)	6.2052	5.9731	5.9931	5.5784	6.175	5.8948
Reasoning score (lower 95% quantile)	2	2	2	2	2	2
Reasoning score (upper 95% quantile)	11	10	11	10	11	10
Reaction time (mean average)	557.681	568.6019	558.2594	573.2577	558.3529	576.9979
Reaction time (lower 95% quantile)	395	405.175	394	404.475	397	410
Reaction time (upper 95% quantile)	879	871	866	847.175	858.45	882
Prospective memory (mean average)	0.7818	0.782	0.7638	0.7258	0.7769	0.7554
Prospective memory (lower 95% quantile)	0	0	0	0	0	0
Prospective memory (upper 95% quantile)	1	1	1	1	1	1

Notes: BPD, bipolar disorder; MDD, major depressive disorder.

*Handgrip mean scores calculated from model with largest available sample size: MDD = 22699, BPD = 1475, Controls = 85893

eTable 3. Results of Sensitivity Analyses, Showing Relationships Between Grip Strength and Cognitive Domains in Fully Adjusted Models[1]												
	Healthy controls					Major Depression				Bipolar Disorder		
Cognitive task	Coeff.	S.E.	T value	p-value	Coeff.	S.E.	T value	p-value	Coeff.	S.E.	T value	p-value
Visual memory*	-0.148	0.0076	-19.5131	<0.001	-0.1222	0.0138	-8.8439	<0.001	-0.0978	0.0542	-1.8033	0.0713
Reaction time*	-0.0311	0.001	-31.5824	<0.001	-0.0342	0.0018	-18.8266	<0.001	-0.0392	0.0072	-5.4109	<0.001
Prospective memory	0.2768	0.0129	21.4405	<0.001	0.3065	0.0242	12.6436	<0.001	0.2396	0.091	2.6316	0.0085

Reasoning	0.1372	0.011	12.4803	<0.001	0.1692	0.02	8.4418	<0.001	0.2963	0.0822	3.6032	<0.001
Number memory	0.1146	0.0128	8.9542	<0.001	0.1445	0.0237	6.0913	<0.001	0.1802	0.1074	1.6781	0.0942

Notes: Coeff, Coefficient from Linear Mixed Model; N, number of participants; S.E. standard error
    *Negative relationship as lower scores = better cognitive performance
    [1]Adjusting waist circumference and history of vascular/heart conditions, along with age, education, gender, bodyweight and region

eTable 4. Full Model Outputs Showing Relationships Between Each Cognitive Domain and All of the Fixed-Effects Confounding Factors controlled for in the primary analyses (displayed in Table 2)

Healthy controls					Major Depression				Bipolar Disorder			
Factor	Coeff.	S.E.	T value	p-value	Coeff.	S.E.	T value	p-value	Coeff.	S.E.	T value	p-value
Visual memory*												
Gender	0.1757	0.0145	12.1568	<0.001	0.1869	0.0282	6.6225	<0.001	0.1204	0.1061	1.1346	0.2565
Age	0.0188	<0.001	28.2259	<0.001	0.0203	0.0013	16.1469	<0.001	0.0102	0.0047	2.1566	0.031
Bodyweight	-0.0372	0.0057	-6.5486	<0.001	-0.0405	0.0105	-3.8478	<0.001	-0.0237	0.0411	-0.5768	0.564
Qualifications	-0.2871	0.0113	-25.4946	<0.001	-0.2378	0.0208	-11.4474	<0.001	-0.3837	0.0829	-4.6279	<0.001
Reaction time*												
Gender	0.0153	0.0019	7.9834	<0.001	0.0256	0.0038	6.7914	<0.001	0.0275	0.0145	1.9012	0.0575
Age	0.0065	<0.001	78.0567	<0.001	0.0068	<0.001	42.4007	<0.001	0.0059	<0.001	9.4224	<0.001
Bodyweight	-0.002	<0.001	-2.6696	0.0076	<0.001	0.0014	0.1243	0.9011	0.001	0.0055	-0.1128	0.9102
Qualifications	-0.0202	0.0014	-14.6937	<0.001	-0.0179	0.0026	-6.8838	<0.001	-0.0174	0.0103	-1.6922	0.0908

Prospective Memory												
Gender	-0.3701	0.0245	-15.078	<0.001	-0.4911	0.0493	-9.9702	<0.001	-0.1187	0.1778	-0.6675	0.5045
Age	-0.0224	0.0011	-20.3095	<0.001	-0.0233	0.0022	-10.6779	<0.001	-0.0186	0.0078	-2.3729	0.0177
Bodyweight	0.0217	0.0095	2.2852	0.0223	0.019	0.0181	1.0463	0.2954	-0.0117	0.0676	-0.1737	0.8621
Qualifications	0.4647	0.0188	24.7243	<0.001	0.4773	0.0365	13.0839	<0.001	0.5366	0.1339	4.0069	<0.001
Reasoning												
Gender	-0.1188	0.0216	-5.5074	<0.001	-0.1726	0.0417	-4.1377	<0.001	-0.1961	0.1639	-1.1962	0.2318
Age	-0.0025	<0.001	-2.743	0.0061	<0.001	0.0018	0.2177	0.8277	0.0155	0.0071	2.1748	0.0298
Bodyweight	0.0586	0.0082	7.1556	<0.001	0.0637	0.0149	4.2788	<0.001	0.0991	0.0624	1.5893	0.1122
Qualifications	1.3735	0.0153	89.5395	<0.001	1.3396	0.0285	46.9323	<0.001	1.5112	0.1162	13.0076	<0.001

Number memory											
Gender	0.069	0.0251	2.7506	0.006	0.0325	0.0489	0.6634	0.5071	0.1398	0.222	0.6296	0.5294
Age	-0.013	0.001	-12.3749	<0.001	-0.0146	0.002	-7.1449	<0.001	-0.0129	0.0096	-1.3374	0.1819
Bodyweight	-0.0396	0.0096	-4.1425	<0.001	-0.0462	0.0173	-2.6729	0.0075	-0.2159	0.0818	-2.641	0.0086
Qualifications	0.4323	0.0179	24.1267	<0.001	0.38	0.0335	11.3459	<0.001	0.3407	0.1539	2.2142	0.0274

Notes: Coeff, Coefficient from Linear Mixed Model; N, number of participants; S.E. standard error .
*Negative relationship as lower scores = better cognitive performance