Research Article

Stuck in A Loop: An Exploratory Study on Metacognition and Neurocognition In Indian Adults With Obsessive Compulsive Disorder (OCD)

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ABSTRACT

Background: Obsessive compulsive disorder (OCD)is often associated with significant impairments in metacognitive beliefs and neurocognitive functioning.While most of the studies in these domain are independent their interrelationship remains underexplored. This study examines the association between metacognitive beliefs and neurocognitive functioning in patients diagnosed with OCD. **Methods:** This exploratory cross sectional study included patients diagnosed with OCD based on ICD criteria. Metacognitions Questionnaire-30 (MCQ-30), NIMHANS Neuropsychological Battery and Yale-Brown Obsessive Compulsive scale (Y-BOCS) were performed to examine relationships. **Results:** Participants demonstrated increased dysfunctional metacognitive beliefs, particularly in domains related to negative beliefs about uncontrollability and cognitive confidence. Significant associations were observed between maladaptive metacognitive beliefs and impairments in executive functions, attention, and working memory ($p < 0.05$). Higher OCD severity was associated with poorer neurocognitive performance and greater metacognitive dysfunction. **Conclusions:** The experience of feeling stuck in the loop in individuals with OCD has clear effect on both metacognition and neurocognition areas and hence would affect their cognitive performance. The findings have implications for pedagogy and research.

Key Words: Metacognition, Neurocognition, OCD, MCQ-30

Introduction

Obsessive Compulsive Disorder (OCD) is when recurrent and intrusive thoughts (obsessions) experienced by individuals, distress them to create repetitive behaviours (compulsions) to reduce distress, whilst stuck in a habitual thought-behaviour loop, affecting daily functioning. sCognitive impairments in OCD are thought to play a crucial role in the initiation and maintenance of obsessive–compulsive symptoms, making them an important focus of contemporary research. The two interrelated domains, neurocognition and metacognition have gained prominence in OCD research. Metacognition is defined as beliefs and processes involved in monitoring, interpreting, and regulating one's own thinking and utilises it in a similar but newer context[1].Metacognitive beliefs are inferred as underlying contributors to disorders characterized by rumination and worry, as Cognitive-Attentional Syndrome (CAS) describes how the brain is "stuck" on certain images, urges, and thoughts. The metacognitive theory explains how individuals regulate their thinking processes to improve efficiency so they are more in control during tasks. Notably, it is the negative metacognitive beliefs that have been found to be particularly influential in feelings of loss of control and its threatening interpretations of mental events affect individuals with OCD through perseverative thinking, threat monitoring, avoidance, and thought suppression. Self-Regulatory Executive Function (SREF) Model emphasises on acquiring control and will, so adjusting thinking strategies could be easier. The ventral striatum and frontal cortex function together to solve problems logically; however, the O-C symptoms interrupt this valuable communication by guiling the brain into thinking that the "trickery" of compulsions is reducing distress

Though both neurocognitive and metacognitive abnormalities have been studied independently in OCD, interrelationship studies are limited. Present evidences suggest that maladaptive metacognitive beliefs may influence neurocognitive performance by increasing cognitive load, impairing attentional control, and disrupting executive functioning. Understanding this relationship is clinically relevant, as it may explain individual variability in symptom severity, treatment response, and functional outcomes. Addressing this gap may contribute to a more comprehensive cognitive framework of OCD and inform assessment and intervention strategies tailored to diverse populations.

The present study aims to study the relationship between metacognitive beliefs and neurocognitive functioning in adults with OCD. By evaluating these domains simultaneously, the study seeks to enhance understanding of the cognitive mechanisms underlying OCD and their potential relevance for clinical practice.

Methods

The study employed an exploratory cross sectional design to evaluate the relationship between meta cognitive beliefs and neurocognitive functioning and also to assess the symptom severity in patients diagnosed with OCD. The study was conducted in a tertiary care hospital from March 2022 – October 2022. The study was approved by the institutional ethical committee (NIEPMD/R.D.20(5)/Ethics Committee/2022). A total of 30 patients were recruited for the study based on the inclusion and exclusion criteria. Patients aged 18 to 50 with a primary diagnosis of OCD considered with minimum 10 years of formal education and willing to participate were included in the study. Those with comorbid psychotic or bipolar disorders, neurological conditions, substance use history, intellectual disabilities, or psychotherapy affecting cognitive performance

were excluded.Participants with average/above average intellectual functioning and mild/moderate/severe levels of OCD were selected through administration of Standard Progressive Matrices (SPM) and Yale Brown Obsessive-Compulsive Scale (YBOCS). Informed consent was obtained from patients prior to the study. To assess their cognitive functions, Metacognitive Questionnaire (MCQ-30) and NIMHANS Neuropsychological Battery (NNB) were used.The data was descriptively analyzed using SPSS v.26 and was subjected to independent sample t-test, One-Way ANOVA and Pearson's Product Moment Correlation.

Results

Sociodemographic characteristics of the participants are presented in **Table 1**.Females (60%) were more with an average age of 37 years, firstborn, employed, Hindu, and belonged to urban socioeconomic background with Contamination – Washing/Cleaning as the predominant OCD symptom type. Participants had completed more than 14+ years of education, diagnosed with OCD for less than 4 years**,** with average intellect, currently on psychopharmaceutical medication, with minimal psychotherapy. There were equal married and unmarried participants. Assessment of metacognitive beliefs showed elevated levels in Lack of Cognitive confidence (M = 18.93), Positive Beliefs about worry (M = 19.20), Cognitive Self-Consciousness (M = 19.70), Negative beliefs about uncontrollability & Danger (M = 19.80), and Need to control thoughts (M = 19.33) the mean Metacognition level of 96.96. The Neurocognitive assessments showed impairments in Mental Motor Speed (Digit Symbol Substitution Test, mean error score = 2.66), Focused Attention (Color Trials Test, mean time taken = T_1-169.20, T_2 - 328.76), Sustained Attention (Digit Vigilance Test, mean errors = 16.96), Divided Attention (The Triads Test, mean errors = 2.26), Category Fluency (Animal Names Test, mean hits = 12.23), Planning (Tower of London Test, mean time taken = 26.54, mean moves = 5.22), Mental Set Shifting (Wisconsin Card Sorting Test, mean error = 2.183, mean failure to make total set = 4.86), Response Inhibition (Stroop Test, mean errors = 11.73, Colour-7.36, Word-4.36), Verbal Learning (Auditory Verbal Learning Test, mean learning score = 50.40, mean memory score = 25.10, mean retention score = 82.96, mean error in verbal learning = 67.10) and, Working Memory (Verbal N – Back Test, total errors = N_1-3.40, N_2-0.96). Correlation analyses showed significant relationship between selected neurocognition and metacognition parameters (**Table 2**), Category Fluency was negatively associated with the Need to control thoughts($r = -.370^{*}$, p-value < 0.044). Negative association was also observed for Moves to plan tasks, and Cognitive Self- Consciousness ($-.552^{**}$, p-value <0.02), time taken to complete Planning tasks, and the total metacognition score($r = -.361^{*}$, p-value <0.05 Working Memory, and Need to control thoughts ($r = -.400^{*}$, p-value< 0.028).Errors in mental set shifting were positively associated with lack of cognitive confidence (r = 0.363, p < 0.048).

Analysis of Variance (Table 3) showed significant difference between neurocognition and O-C Type in the areas: time taken for Planning (F = 2.624, p<0.05), Failure to Maintain Set Shifting (F = 6.154, p<0.001), Response Inhibition (Functional Error -F = 5.188, p< 0.003; Total Error (F = 5.258, p<0.003). Overall, there is no significant difference between O-C Type and Metacognition. It is indicated that error variance of each dependent variable (Table 4) is equal across the group and that there is a significant difference between the domains of neurocognition with the O-C Symptoms severity in the areas: Obsession severity and Response Inhibition (Functioning Errors - t (17.350) = 2.012, p< .05), OCD severity and, Planning (t (28) = 2.648, p<.013) and Response Inhibition(Functioning Errors - t (10.407) = 1.924, p<.028).

Discussion

The present findings indicate significant relationship between Metacognition (needing to control their thoughts, lacking in cognitive confidence, and having cognitive self-consciousness) and Neurocognition (time taken for planning, response inhibition, working memory and set shifting ability). Participants showed elevated negative beliefs about uncontrollability and danger, emphasizing that they predominantly believe that their thoughts and worries are harmful and of external locus of control[3]over their anxieties and emotions. Self focussed attention is low in individuals with OCD[4]and focusing mainly on negative thoughts. The metacognitive model emphasizes on the importance and meaning of thoughts, the need to control them, and perform rituals to prevent its dreaded consequences. The metacognitions that are specific to OCD are thought fusion beliefs, beliefs about rituals, and stop signals[5]. A significant negative relationship between Category Fluency and Need to control thoughts highlighted that individuals with OCD have multiple thoughts, new ideas and problem-solving skills, however, hard to move on from, hence disabling their functioning. This could be linked to the significant negative relationship between time taken to Planning tasks and Cognitive Self- Consciousness and total metacognition score, which indicates difficulty in planning simple and complex tasks due to low level of cognitive awareness emphasizing how cognitive self-consciousness is linked to better planning in Indian populations[6] and how the more aware one is of the task, it aids them to think ahead and make rational decisions, even if tasks are complex.

A significant positive relationship between Mental Set Shifting and Cognitive confidence indicate that the more they lack in confidence of their own ability, the harder it would be in shifting the mindsets or thoughts. However, learning and observer effects in participants could be present. A significant negative relationship between errors in Working Memory, and Need to control thoughts indicate that individuals with OCD could be so preoccupied with their thoughts that tasks that require working memory get affected. This could be due tosignificant neuropsychological deficits marked in tests of set-shifting ability, planning time, response inhibition and working memory[7] where individuals with OCD performed poorly at the highest level of task difficulty and engaged with same brain regions involved in working memory, during the N-back task [8].

It is key to note significant difference between O-C Type and Planning, Set Shifting, and Response Inhibition. This suggests that the nature of the O-C symptom may affect one's organising time of intermediate tasks and their ability to mentally shift thoughts, leading to a decline in overall performance; proving a strong relationship between executive functioning and type of OCD. Although the number of dimensions is still debated, symmetry/ordering, hoarding, contamination/cleaning,

aggressive/checking, and sexual/religious symptom dimensions are possible types. Specific to washing and hoarding, research evidence supports significantly worse performance on response inhibition, set shifting, spatial planning, probabilistic learning and reversal, with intact decision making[10]. Individuals with obsessions/checking rituals show severe memory deficits and decreased activity in the postcentral gyrus than those with cleanliness/washing rituals, indicating visual working memory dysfunction; hence demonstrating difficulties in visual organization and mental manipulation of visual information, which might cause repetitive thoughts and behaviour[11].Studies show support for metacognitive beliefs predicting OCD[5,12] with associations emphasising that anxiety can increase and maintain O-C symptoms through blocking mind from thoughts about condition, viewing their thoughts as burdensome or refusing to reflect independently. There is a significance relationship between obsession severity and Response Inhibition suggesting a cause of errors in tasks and strong contribution to low life perspective. Due to demoralization and hopelessness caused by obsessions, these individuals view life as difficult and worthless[13]-significance significant relationship is also observed between OCD severity and, Planning intermediate tasks and Response Inhibition whichmay affect their performance, decision making, processing speed and correspondence. These findings correlate with neurocognitive difficulties in planning, set-shifting, and logical memory, as found amongst the Indian population[6]. A similar stance is seen in individuals with OCD with mild and moderate severity appearing to have executive functioning deficits in set-shifting, inhibitory control, working memory, and planning ability [15]. They showed errors or missed responses or took longer time to respond. On spatial working memory, individuals with OCD showed significant impairment[16].This study supports individuals with mild form of OCD severity have better adherence to treatment as well as show good prognosis in a potential metacognitive-OCD therapy pilot trial[17]. They were found to be more insightful towards metacognitive questions despite maintaining factors of the illness. Whereas in the population with moderate to severe levels of OCD; chances are they may not have been able to reflect upon their thinking and find it difficult to pay attention and not worry about their negativism while controlling those thoughts.

Limitations

A control group could be used to explore the differences in the variable further in a clinical population and a healthy population. The prolonged length of the sessions due to the impact of OCD may have affected the performance. A multicentric study would have given a more comprehensive and representative understanding.

Conclusion

The pilot nature of the present study serves as a test trial to check the feasibility for approaching metacognition therapy infused with cognitive retraining in an adult population. The findings highlighted significant effects in the Neurocognitive area such as Mental Set Shifting, Response Inhibition, Planning, Category Fluency, Working Memory, and, Metacognition areas such as Need to control thoughts, Cognitive Self- Consciousness, Lack of Cognitive confidence, in individuals with OCD. The OCD type, obsessions severity and OCD Severity affected the functioning. These results suggest that along with psychotherapy targeted interventions addressing their cognitive ability may improve their symptomatology, thus reducing the experience of being stuck in a loop.

Author Contributions

- **BTT:** Conceptualization, Experiments, drafting, Validation
- **P. K:** Conceptualization, Experiments, drafting, reviewing, supervision validation
- **SK:** Resources, technical validation, supervision
- **G S:** reviewing, validation

Ethical Consideration

This research with name code NIEPMD/R.D.20(5)/Ethics Committee/2022, received approval from the National Institute for Empowerment of Persons with Multiple Disabilities (NIEMPD) Divyangjan Ethical Committee and no internal funding was granted.

Consent to publish

Consent for publication was obtained as part of the institutional ethical approval process.

Consent to participate

Written informed consent was obtained from all participants prior to their inclusion in the study.

Declaration of competing interest

The authors have no conflicts of interest to declare.

Ethical Consideration & Funding

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Declaration of competing interest

The authors have no conflicts of interest to declare.

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Data Availability : The datasets generated and/or analysed during the current study are not publicly available due to ethical and participant confidentiality considerations but are available from the corresponding author on reasonable request.

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Tables

Table 1 shows the Sociodemographic characteristics of patients diagnosed with OCD represented as Percentage and Mean withStandard Deviation.

Socio - Demographic Variables	N	%	M	SD
Age - 18 to 50 years	30	-	37.19	-
Gender				
Male	12	40	-	-
Female	18	60	-	-
Marital Status				
Married	15	50	-	-
Unmarried	15	50	-	-
Occupation				
Employed	13	43	-	-
Between Jobs	2	7	-	-
Home Maker	6	20	-	-
Business person	3	10	-	-
Student	6	20	-	-
Socio- Economic Background				
Rural (<5000INR)	5	17	3600.17	-
Sub-urban (5000INR - 50000INR)	7	23	31000.43	-
Urban (>50000INR)	18	60	740300.1	-
Religion				
Hinduism	16	53	-	-
Islam	8	27	-	-
Christianity	5	17	-	-
Others	1	3	-	-
Birth Order				
First born	14	47	-	-
Middle Child	11	37	-	-
Youngest	3	10	-	-
Only Child	2	6	-	-
Type of O-C Symptoms				
Contamination – Washing/Cleaning	11	37	-	-
Symmetry/Order – Organization	4	13	-	-
Intrusive Thoughts – Avoid/Pray (Harmful / Sexual / Religious)	6	20	-	-
Doubts – Checking	7	23	-	-
Concerns – Hoarding	2	7	-	-
Durations				
Years of Education	-	-	14.86	3.54
Duration of Illness	-	-	3.83	2.42
Duration of Medication	25	83	2.06	2.59
Duration of Therapy	14	46	1.30	1.87
Intelligence Quotient Score	-	-	46.76	1.99

Table 2 shows correlations between of the dimensions of Metacognition and the domains of Neurocognition.

		LOCC	PBW	CSC	NBUD	NCT	MTS
MMS	Pearson Correlation (r)	0.019	-0.092	0.237	0.331	0.05	0.246
	p-value	0.922	0.629	0.208	0.074	0.773	0.191
FA	Pearson Correlation (r)	0.126	0.222	-0.103	-0.257	-0.070	-0.027
	p-value	0.507	0.239	0.589	0.170	0.712	0.889
HFA	Pearson Correlation (r)	0.188	0.141	-0.024	-0.249	-0.168	-0.011
	p-value	0.321	0.458	0.901	0.184	0.374	0.956
SA	Pearson Correlation (r)	-.185	.159	-.115	.544	-.049	-.143
	p-value	.328	.400	.544	.759	.799	.450
DA	Pearson Correlation (r)	-0.118	0.101	-0.023	0.123	0.088	0.036
	p-value	0.534	0.596	0.905	0.516	0.642	0.851
CF	Pearson Correlation (r)	0.332	-0.096	-0.182	-0.237	-.370*	-0.170
	p-value	0.073	0.615	0.337	0.207	0.044	0.369
PM3	Pearson Correlation (r)	.090	.066	-.088	.05	-.186	-.022
	p-value	.637	.730	.644	.789	.324	.907
PM4	Pearson Correlation (r)	.236	.014	-.043	-.014	-.136	.05
	p-value	.209	.941	.823	.941	.473	.768
PM5	Pearson Correlation (r)	.235	-.034	.199	.138	-.229	.194
	p-value	.212	.858	.291	.467	.224	.305
PT2	Pearson Correlation (r)	-.016	-.045	-.742**	.195	.294	-.257
	p-value	.934	.813	<.000	.301	.114	.171
PT3	Pearson Correlation (r)	.120	-.05	-.312	-.129	-.076	-.197
	p-value	.527	.785	.094	.498	.691	.296
PT4	Pearson Correlation (r)	.009	-.036	-.552**	-.05	-.087	-.361*
	p-value	.964	.851	.002	.757	.649	.05
PT5	Pearson Correlation (r)	.180	.147	-.132	-.073	-.200	-.018
	p-value	.340	.439	.487	.701	.289	.923
TEMSS	Pearson Correlation (r)	.363*	0.229	0.018	-0.273	-0.035	0.176
	p-value	0.048	0.223	0.926	0.145	0.856	0.351
FMS	Pearson Correlation (r)	0.178	-0.327	0.225	0.273	0.173	0.260
	p-value	0.346	0.078	0.233	0.145	0.362	0.165
FE	Pearson Correlation (r)	0.085	-0.05	0.211	-0.195	0.147	0.122
	p-value	0.657	0.785	0.264	0.302	0.439	0.521
HFE	Pearson Correlation (r)	0.046	-0.289	0.066	-0.166	-0.028	-0.113
	p-value	0.809	0.122	0.730	0.381	0.881	0.551
TERI	Pearson Correlation (r)	0.078	-0.165	0.173	-0.207	0.087	0.032
	p-value	0.681	0.384	0.361	0.272	0.646	0.865
LS	Pearson Correlation (r)	-0.318	0.062	-0.008	0.289	0.077	-0.021
	p-value	0.087	0.745	0.967	0.122	0.687	0.911
MS	Pearson Correlation (r)	0.070	-0.116	0.246	-0.122	-0.337	-0.031
	p-value	0.713	0.543	0.189	0.519	0.068	0.872
RS	Pearson Correlation (r)	0.047	-0.118	0.280	-0.201	-0.124	0.020
	p-value	0.805	0.535	0.133	0.286	0.514	0.917
TEVL	Pearson Correlation (r)	0.234	0.077	-0.047	-0.178	-0.035	0.05
	p-value	0.213	0.684	0.804	0.347	0.856	0.788
WM1	Pearson Correlation (r)	0.014	0.242	-0.031	0.069	-.400*	-0.036
	p-value	0.942	0.198	0.870	0.717	0.028	0.849
WM2	Pearson Correlation (r)	-0.130	0.040	-0.017	-0.040	-0.223	-0.157
	p-value	0.493	0.832	0.929	0.834	0.236	0.409

** p-value < 0.01 * p-value < 0.05 Note. LOCC = Lack of Cognitive confidence, PBW = Positive Beliefs about worry. CSC = Cognitive Self- Consciousness, NBUD = Negative beliefs about uncontrollability & Danger, NCT = Need to control thoughts, and, MTS = Metacognition Total Score, MMS = Mental - Motor Speed, FA = Focused

Attention, HFA = (Higher) Focused Attention, SA = Sustained Attention, DA = Divided Attention, CF = Category Fluency, PM2 = Planning – moves used for 2 moves, PM3 = Planning – moves used for 3 moves, PM4 = Planning – moves used for 4 moves, PM5 = Planning – moves used for 5 moves, PT2 = Planning – time taken for 2 moves, PT3 = Planning – time taken for 3 moves, PT4 = Planning – time taken for 4 moves, PT5 = Planning – time taken for 5 moves, TEMSS = Total Errors in Mental Set Shifting, FMS = Failure to Maintain Set (Lack of Mental Set Shifting), FE = Functioning Errors – Colour, HFE = (Higher) Functioning Errors – Word, TERI = Total Errors in Response Inhibition, LS = Learning Score, MS = Memory Score, RS = Retention Score, TEVL = Total Error in Verbal Leaning, WM1 = NBack1 Error in Working Memory, and, WM2 = NBack2 Error in Working Memory.The Planning – moves used for 2 moves (PM2) was all constant hence it was not computed in the Pearson's Correlation table.

Table 3 shows the one-way ANOVA measures of OC – Symptoms Type with various domains of Neurocognition and dimensions of Metacognition.

Neuro Cog	O-C Symptoms Type		Meta Cog	O-C Symptoms Type	
Variables	F	P	Variables	F	p
MMS	.804	.534	LOCC	1.625	.199
FA	.905	.476	PBW	1.589	.208
HFA	.613	.657	CSC	.315	.865
SA	1.781	.164	NBUD	1.542	.221
DA	.418	.794	NCT	.968	.443
CF	.998	.427	MTS	1.035	.409
PM3	.651	.632			
PM4	.410	.800			
PM5	.125	.972			
PT2	.900	.479			
PT3	2.624	.05			
PT4	.787	.545			
PT5	.403	.805			
TEMSS	.255	.904			
FMS	6.154	.001			
FE	5.188	.003			
HFE	1.973	.130			
TERI	5.258	.003			
LS	1.240	.320			
MS	.544	.705			
RS	1.740	.173			
TEVL	.967	.443			
WM1	.792	.542			
WM2	.952	.451			

Note.MMS = Mental - Motor Speed, FA = Focused Attention, HFA = (Higher) Focused Attention, SA = Sustained Attention, DA = Divided Attention, CF = Category Fluency, PM2 = Planning – moves used for 2 moves, PM3 = Planning – moves used for 3 moves, PM4 = Planning – moves used for 4 moves, PM5 = Planning – moves used for 5 moves, PT2 = Planning – time taken for 2 moves, PT3 = Planning – time taken for 3 moves, PT4 = Planning – time taken for 4 moves, PT5 = Planning – time taken for 5 moves, TEMSS = Total Errors in Mental Set Shifting, FMS = Failure to Maintain Set (Lack of Mental Set Shifting), FE = Functioning Errors – Colour, HFE = (Higher) Functioning Errors – Word, TERI = Total Errors in Response Inhibition, LS = Learning Score, MS = Memory Score, RS = Retention Score, TEVL = Total Error in Verbal Leaning, WM1 = NBack1 Error in Working Memory, and, WM2 = NBack2 Error in Working Memory. LOCC = Lack of Cognitive confidence, PBW = Positive Beliefs about worry. CSC = Cognitive Self- Consciousness, NBUD = Negative beliefs about uncontrollability & Danger, NCT = Need to control thoughts, and, MTS = Metacognition Total Score.

Table 4 shows the independent sample t – Test measures, of O-C Symptoms severity - Obsessions, Compulsions and OCD, with the domains of Neurocognition.

Variables	Obsessions	Compulsions	OCD

	t	df	p	T	df	p	t	Df	p
MMS	.000	17.638	1.000	-1.065	15.933	.303	.402	10.427	.696
FA	.272	22.864	.788	-.522	12.096	.611	-.042	12.532	.967
HFA	.206	20.890	.839	-.751	13.944	.465	.103	11.473	.920
SA	-.193	20.952	.848	-.353	8.014	.733	-.042	11.999	.967
DA	.105	19.695	.917	.886	7.315	.404	.721	11.402	.485
CF	.465	22.377	.646	-.795	9.667	.446	.275	14.436	.787
PM3	-.187	27.995	.853	.288	18.089	.777	-.796	27.825	.433
PM4	.972	28	.340	.144	8.876	.889	1.654	28	.109
PM5	-.210	24.008	.836	-.218	13.501	.831	-.047	14.645	.963
PT2	-.793	24.831	.435	-.525	14.841	.607	-.650	26.203	.521
PT3	.767	28	.449	1.630	28	.114	1.516	28	.141
PT4	1.639	28	.112	1.570	28	.128	2.648	28	.013
PT5	1.127	20.079	.273	-.108	9.333	.916	.452	15.041	.658
TEMSS	.776	27.576	.445	-1.472	9.042	.175	-.372	22.421	.714
FMS	-.258	27.037	.799	-.006	10.583	.995	-.144	16.603	.887
FE	2.012	17.350	.050	.747	7.109	.479	1.924	10.407	.028
HFE	-.473	21.556	.641	-.137	28	.892	-.092	11.785	.928
TERI	.300	21.207	.767	-.131	8.061	.899	.438	11.805	.670
LS	-.339	24.475	.738	.185	22.290	.855	.102	28.000	.920
MS	1.539	27.686	.135	.160	16.475	.875	.604	19.592	.553
RS	.116	27.221	.909	-.832	18.729	.416	-.683	22.084	.501
TEVL	-.379	26.428	.707	.480	17.729	.637	.126	24.822	.900
Wm1	.454	26.437	.653	.273	22.502	.787	.972	16.134	.345
WM2	.057	24.284	.955	-.865	11.408	.405	.200	15.506	.844
LOCC	1.486	18.025	.154	.224	8.985	.828	.598	11.177	.562
PBW	1.782	27.354	.086	.416	10.897	.686	.897	24.970	.378
CSC	-.849	27.273	.403	-.380	15.039	.709	-.605	24.902	.550
NBUD	-1.431	28	.164	.376	11.836	.713	-.955	28	.348
NCT	-.472	27.839	.641	-1.349	13.938	.199	-.954	28	.348
MTS	.341	24.972	.736	-.159	10.278	.877	-.296	14.570	.772

Note. MMS = Mental - Motor Speed, FA = Focused Attention, HFA = (Higher) Focused Attention, SA = Sustained Attention, DA = Divided Attention, CF = Category Fluency, PM2 = Planning – moves used for 2 moves, PM3 = Planning – moves used for 3 moves, PM4 = Planning – moves used for 4 moves, PM5 = Planning – moves used for 5 moves, PT2 = Planning – time taken for 2 moves, PT3 = Planning – time taken for 3 moves, PT4 = Planning – time taken for 4 moves, PT5 = Planning – time taken for 5 moves, TEMSS = Total Errors in Mental Set Shifting, FMS = Failure to Maintain Set (Lack of Mental Set Shifting), FE = Functioning Errors – Colour, HFE = (Higher) Functioning Errors – Word, TERI = Total Errors in Response Inhibition, LS = Learning Score, MS = Memory Score, RS = Retention Score, TEVL = Total Error in Verbal Leaning, WM1 = NBack1 Error in Working Memory, and, WM2 = NBack2 Error in Working Memory. LOCC = Lack of Cognitive confidence, PBW = Positive Beliefs about worry. CSC = Cognitive Self- Consciousness, NBUD = Negative beliefs about uncontrollability & Danger, NCT = Need to control thoughts, and, MTS = Metacognition Total Score