

Table e-1: Comparison of Diffusion Tensor Imaged versus Non Imaged Patients

	Variable	Imaged (N=69)	Non Imaged (N=80)	T Stat (χ^2)	P value (unc)
Demographics & Cognition	Age	68.7±8.0	71.1±8.4	1.5	0.14
	Gender M:F	38:31	38:42	($\chi^2=0.85$)	0.40
	ACE-R Total (max 100)	67.3±22.3	59.3±22.7	-1.6	0.12
	MMSE Total (max 30)	23.0±6.8	20.8±6.7	-1.6	0.14
	FRS % Score (max 100)	40.6±27.3	40.6±27.3	-1.3	0.19
Questionnaires	Apathy Evaluation Scale (AES, max 72):				
	-carer	46.9±12.4	50.2±12.3	1.4	0.17
	-patient	36.7±9.2	34.0±10.0	-1.0	0.29
	-clinician	43.4±9.6	44.5±11.3	0.5	0.61
	Barratt Impulsiveness Scale (BIS, max 120)	64.2±7.8	61.0±8.7	-1.4	0.17
	Behavioural Inhibition System/Behavioural Activation System (BIS/BAS):				
	-BIS subscore	20.8±4.7	19.7±3.4	-1.0	0.41
	-BAS drive	11.0±3.3	10.6±2.8	-0.4	0.70
	-BAS funseeking	11.2±2.9	11.6±3.7	0.4	0.70
	-BAS Reward Responsivness	16.4±2.7	17.3±2.7	1.1	0.29
	Motivation and energy inventory (MEI, max 144)	80.3±27.4	84.6±21.8	0.5	0.59
	Beck depression inventory (BDI, max 63)	13.3±10.7	12.2±7.6	-0.4	0.70
	Snaith Hamilton pleasure scale (SHAPS, max 56)	22.4±5.1	22.9±3.7	0.4	0.70
	Neuropsychiatric inventory (NPI, fraction with positive response):				
	-Apathy subscore	0.60±0.49	0.64±0.48	0.5	0.62
	-Disinhibition subscore	0.36±0.48	0.30±0.47	-0.6	0.60
	Cambridge behavioural inventory (CBI-R, max 180)	62.8±35.2	72.3±34.9	1.4	0.16
	Kirby (difference)	0.01±0.05	0.03±0.06	1.4	0.17
Behavioural Tasks	Information Sampling Task (IST)				
	-Probability of being correct Fixed	0.75±0.15	0.74±0.13	-0.3	0.80
	-Probability of being correct Decreasing	0.67±0.17	0.67±0.10	0.1	0.91
	Cued reinforcement reaction time (CRRT)				
	-Total Errors	4.2±5.0	1.9±2.0	-1.5	0.15
	Stop Signal Task (SST)				
	-Stop signal reaction time (SSRT)	447.0±244.3	548.5±176.7	1.3	0.20
	Motor Go/NoGo Dprime	3.2±1.3	2.9±1.1	-0.8	0.41
	Saccade Dprime	0.79±1.1	0.62±1.1	-0.4	0.68

Comparison of imaged versus non-imaged sample using Student's Independent T-Test and Chi-squared for gender comparison between groups. All variables were non-significant.

Table e-2: Full Rotated Component Matrix Extracted from Final Principal Component Analysis

INPUT VARIABLE	COMPONENT STRUCTURE							
	PC1 Patient Rated Change	PC2 Carer Rated Everyday Skills & Self Care	PC3 Carer Rated Challenging Behaviours	PC4 Impulsive/Reward Related Behaviours	PC5 Impulsivity Self Report	PC6 Goal-directed Decision making	PC7 Stop Signal Task	PC8 Outcome Sensitivity
<i>Eigenvalue I/R</i>	4.963/3.438	2.183/2.284	1.664/2.145	1.514/1.819	1.385/1.640	1.186/1.284	1.111/1.245	1.039/1.188
AES 1	0.832	-0.069	-0.121	0.151	-0.078	-0.003	-0.041	-0.069
BIS 1	0.735	0.086	0.083	0.221	0.080	-0.003	-0.095	-0.052
BDI-T	0.756	0.345	0.100	0.073	0.158	0.097	-0.026	-0.030
MEI-T	-0.837	-0.232	-0.061	-0.109	-0.023	0.034	0.142	0.007
SHAPS-T	0.688	0.147	0.281	-0.067	-0.276	-0.136	0.068	0.075
AES 2	0.067	0.714	0.529	0.074	0.035	0.006	-0.110	-0.151
CBI 2	0.233	0.831	-0.084	0.151	-0.113	0.023	-0.155	0.042
NPI-A	0.192	0.705	0.355	0.119	-0.086	0.048	0.029	-0.050
CBI 1	0.035	0.118	0.880	0.078	0.104	-0.135	-0.066	-0.069
NPI-D	0.135	0.083	0.825	-0.008	-0.017	0.039	0.017	0.092
IST 2	0.170	0.030	-0.037	0.683	-0.128	0.365	-0.166	0.006
CRRT 1	0.007	0.014	-0.006	0.658	-0.013	-0.104	0.390	0.109
Go/NoGo	-0.259	-0.135	-0.113	-0.642	0.130	0.042	0.259	0.007
Saccades	-0.162	-0.198	-0.081	-0.530	-0.319	0.221	0.018	0.158
BIS 2	0.022	-0.121	-0.015	-0.100	0.841	-0.023	-0.065	0.077
BISBAS 1	-0.198	-0.005	0.265	0.083	0.631	0.375	-0.209	-0.011
IST 1	-0.188	-0.204	-0.080	-0.177	0.013	0.556	0.311	0.052
CRRT 2	0.084	0.162	-0.037	0.063	0.078	0.725	-0.031	-0.078
SST 1	0.183	0.109	0.021	0.044	0.167	-0.087	-0.793	0.030
BISBAS 2	0.068	0.090	-0.088	0.042	0.242	-0.179	0.141	0.804
Kirby	0.199	0.230	-0.126	0.040	0.220	-0.151	0.215	-0.658
IST 3	0.255	0.382	-0.198	-0.167	0.335	-0.007	0.283	-0.001

Numbers (1, 2, 3) indicate the different components extracted from LPCA for AES, CBI, BIS, BIS/BAS, IST, SST, CRRT. Additional input variables included the total score for BDI, MEI and SHAPS, NPI apathy and disinhibition subscores, Kirby difference value representing the difference in delayed discounting for low versus high rewards and Dprime performance accuracy values for Go/NoGo tasks. High scores on component 1-5 and 8 indicate worse performance, whereas low scores on component 6 and 7 indicate worse performance. Initial (I) and rotated (R) eigenvalues are reported.

Table e-3: White Matter Tract Associations using the JHU White-Matter-Tractography Atlas and ICBM-DTI-81 White Matter Labels Atlas (B=Bilateral, R=Right, L=Left, *=Not specified).

Component	Tractography Atlas	MD	Labels Atlas	MD
2	Superior longitudinal fasciculus	B	Superior longitudinal fasciculus	B
	Inferior longitudinal fasciculus	B	Genu/Body/Splenium of corpus callosum	*
	Anterior thalamic radiation	B	Anterior corona radiata	R
	Corticospinal tract	B	Posterior corona radiata	B
	Inferior fronto-occipital fasciculus	B	Superior corona radiata	B
	Uncinate fasciculus	B	Posterior thalamic radiation	B
	Cingulum	B	Cingulum	B
	Forceps major	*	Superior fronto-occipital fasciculus	B
	Forceps minor	*	Sagittal stratum	R
			Cerebral peduncle	R
			Anterior limb of internal capsule	B
			Posterior limb of internal capsule	B
			Retrolenticular part of internal capsule	B
			External capsule	B
			Tapetum	B
3	Anterior thalamic radiation	B	Genu/Body of corpus callosum	*
	Forceps major	*	Anterior limb of internal capsule	B
	Forceps minor	*	Anterior corona radiata	B
	Inferior fronto-occipital fasciculus	B	Superior corona radiata	B
	Inferior longitudinal fasciculus	B	Superior longitudinal fasciculus	L
	Superior longitudinal fasciculus	B	Sagittal stratum	B
	Uncinate fasciculus	B	Uncinate fasciculus	B
	Cingulum	B	Cingulum	B
			External capsule	B
			Retrolenticular part of internal capsule	B
4	Anterior thalamic radiation	R	Genu/Body/Splenium of corpus callosum	*
	Corticospinal tract	R	Retrolenticular part of internal capsule	R
	Cingulum	R	Anterior corona radiata	R
	Forceps major	*	Superior corona radiata	R
	Forceps minor	*	Posterior corona radiata	R
	Inferior fronto-occipital fasciculus	R	Superior longitudinal fasciculus	R
	Inferior longitudinal fasciculus	R	Posterior thalamic radiation	R
	Superior longitudinal fasciculus	B	Tapetum	R
	Uncinate fasciculus	R		