

Supporting Information

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Table S1. Gray and white matter regional volumes of TD, DD, and FXS groups

Brain regions	Mean average						Standard error of the mean					
	Time1			Time2			Time1			Time2		
	TD	DD	FXS	TD	DD	FXS	TD	DD	FXS	TD	DD	FXS
Gray matter												
Main effect of diagnosis: FXS > TD/DD												
Bil Caudate Body; Caudate Head; Putamen	1.878	1.869	2.090	2.010	1.917	2.252	0.039	0.041	0.066	0.073	0.018	0.027
Rt Middle, Inferior, Superior Frontal Gyri	0.301	0.309	0.323	0.346	0.334	0.376	0.007	0.007	0.009	0.011	0.003	0.005
Rt Fusiform, Parahippocampal Gyri; Culmen of Cerebellum	1.032	1.010	1.109	1.122	1.061	1.228	0.018	0.018	0.033	0.039	0.008	0.013
Bil Superior, Medial Frontal, Pre, Postcentral Gyri; Paracentral Lobule	5.067	5.232	5.409	5.430	5.116	6.111	0.043	0.087	0.109	0.179	0.038	0.116
Lt Middle, Superior Frontal Gyri	0.138	0.133	0.148	0.161	0.146	0.172	0.003	0.003	0.006	0.004	0.002	0.003
Lt Culmen, Tuber of Cerebellum	0.740	0.724	0.789	0.796	0.754	0.859	0.022	0.039	0.012	0.011	0.009	0.009
Lt Superior, Middle Frontal Gyri	0.177	0.177	0.195	0.212	0.197	0.231	0.005	0.005	0.010	0.006	0.003	0.004
Lt Superior, Middle, Inferior Occipital, Middle Temporal, Fusiform, Lingual Gyri; Declive of Cerebellum	0.167	0.166	0.186	0.181	0.170	0.192	0.004	0.005	0.002	0.006	0.003	0.004
Main effect of diagnosis: TD/DD > FXS												
Rt Insula; Precentral Gyrus	1.545	1.569	1.410	1.725	1.683	1.564	0.026	0.027	0.046	0.027	0.012	0.016
Lt Insula; Inferior Frontal Gyrus	1.423	1.445	1.315	1.599	1.569	1.449	0.020	0.022	0.035	0.027	0.010	0.013
Posterior Cingulate; Precuneus	0.515	0.580	0.476	0.541	0.589	0.491	0.015	0.014	0.023	0.034	0.008	0.008
Uvula of Vermis	0.249	0.247	0.231	0.286	0.275	0.254	0.009	0.019	0.007	0.007	0.004	0.004
Posterior Cingulate	0.173	0.188	0.157	0.188	0.193	0.166	0.004	0.007	0.008	0.013	0.003	0.003
Interaction: FXS (Time2 > Time1) > TD/DD (Time2 > Time1)												
Rt Inferior, Middle Temporal, Middle Frontal Gyri	8.265	8.374	8.411	8.560	8.084	9.352	0.071	0.115	0.148	0.274	0.048	0.146
Lt Inferior Frontal, Rectal, Orbital, Middle Frontal Gyri	0.570	0.601	0.563	0.617	0.613	0.652	0.009	0.010	0.018	0.016	0.005	0.012
Lt Lingual, Inferior Occipital Gyri	0.416	0.430	0.419	0.414	0.428	0.453	0.013	0.015	0.020	0.018	0.008	0.010
Posterior Cingulate, Cingulate Gyrus, Precuneus	0.373	0.388	0.388	0.408	0.408	0.436	0.008	0.009	0.015	0.016	0.005	0.007
Lt Inferior Temporal, Fusiform, Middle, Inferior Occipital, Lingual Gyri; Cerebellum	1.083	1.080	1.101	1.155	1.102	1.228	0.018	0.019	0.016	0.029	0.008	0.009
Bil Ventral Anterior, Medial Dorsal Nucleus of Thalamus	0.957	0.958	0.964	1.019	0.953	1.074	0.018	0.020	0.022	0.024	0.012	0.012
White matter												
Main effect of diagnosis: FXS > TD/DD												
Rt Ventral, Dorsal Prefrontal Regions, Medial Temporal Regions	3.122	3.112	3.320	3.641	3.600	3.951	0.024	0.033	0.050	0.133	0.018	0.055
Lt Ventral, Dorsal Prefrontal Regions, Medial Temporal Regions	1.980	1.986	2.099	2.296	2.280	2.479	0.019	0.023	0.029	0.078	0.011	0.032
Main effect of diagnosis: TD/DD > FXS												
Rt Lateral Central Region	0.238	0.237	0.213	0.281	0.284	0.255	0.004	0.005	0.005	0.019	0.003	0.005
Lt Lateral Central Region	0.150	0.158	0.137	0.177	0.182	0.164	0.003	0.004	0.005	0.010	0.002	0.004
Interaction: FXS (Time2 > Time1) > TD/DD (Time2 > Time1)												
Bil Ventral, Dorsal Prefrontal Regions, Medial Temporal Regions	8.210	8.234	8.347	9.489	9.353	9.998	0.084	0.078	0.117	0.332	0.047	0.136
Lt Medial Temporal Region	0.185	0.189	0.190	0.237	0.232	0.257	0.006	0.006	0.004	0.009	0.004	0.006

Order corresponds to those listed in Table S2. Units are in milliliters.

Table S2. Gray and white matter regional volume differences between groups and over time

Brain regions	Brodmann area	Talairach coordinates			T value	Threshold (FDR)	Cluster size, voxels 1 × 1 × 1 mm
		X	Y	Z			
Gray matter							
Main effect of diagnosis: FXS > TD/DD							
Bil Caudate Body; Caudate Head; Putamen		-16	8	11	9.09	<0.001	3114
		16	14	5	8.52	<0.001	
		18	8	12	8.31	<0.001	
Rt Middle, Inferior, Superior Frontal Gyri	11, 47	22	44	-11	5.99	<0.001	488
		18	24	-16	3.74	0.01	
Rt Fusiform, Parahippocampal Gyri; Culmen of Cerebellum	20, 36	44	-32	-24	5.82	<0.001	1458
		53	-42	-23	4.85	<0.001	
		40	-37	-32	4.3	<0.001	
Bil Superior, Medial Frontal, Pre, Postcentral Gyri; Paracentral Lobule	8, 5, 6	14	39	44	5.7	<0.001	8125
		-2	-42	61	5.4	<0.001	
		-2	33	46	5.38	<0.001	
Lt Middle, Superior Frontal Gyri	11	-22	48	-11	5.58	<0.001	222
Lt Culmen, Tuber of Cerebellum		-34	-40	-28	4.44	<0.001	1006
		-51	-44	-23	3.99	<0.001	
Lt Superior, Middle Frontal Gyri	10	-28	46	20	4.35	<0.001	255
Lt Superior, Middle, Inferior Occipital, Middle Temporal, Fusiform, Lingual Gyri; Declive of Cerebellum	19, 39, 18	-38	-82	28	3.5	0.01	251
		-36	-71	24	3.41	0.01	
Main effect of diagnosis: TD/DD > FXS							
Rt Insula; Precentral Gyrus	13, 6	42	-5	15	7.11	<0.001	2035
		53	-10	28	5.46	<0.001	
		34	10	9	5.39	<0.001	
Lt Insula; Inferior Frontal Gyrus	13, 45	-30	24	10	6.06	<0.001	1881
		-34	1	13	5.71	<0.001	
		-38	-11	13	5.34	<0.001	
Posterior Cingulate; Precuneus Uvula of Vermis	31, 30	22	-60	14	5.08	<0.001	636
		0	-66	-32	4.68	<0.001	320
		2	-48	-25	3.46	0.02	
Posterior Cingulate	30	-14	-63	14	4.18	<0.001	216
		-22	-55	21	3.39	0.02	
Interaction: FXS (Time2 > Time1) > TD/DD (Time2 > Time1)							
Rt Inferior, Middle Temporal, Middle Frontal Gyri	20, 9, 21, 8	59	-30	-20	6.32	<0.001	12950
		53	15	34	5.73	<0.001	
		67	-16	-1	5.59	<0.001	
Lt Inferior Frontal, Rectal, Orbital, Middle Frontal Gyri	47, 11	-14	9	-22	5.11	<0.001	899
		-8	22	-25	4.99	<0.001	
		4	28	-27	4.9	<0.001	
Lt Lingual, Inferior Occipital Gyri	17, 18	-12	-94	-10	4.71	0.01	631
		-2	-82	-6	4.1	0.01	
Posterior Cingulate, Cingulate Gyrus, Precuneus	23, 31	-2	-32	22	4.56	0.01	549
		14	-33	38	2.84	0.03	
		-8	-51	32	2.72	0.04	
Lt Inferior Temporal, Fusiform, Middle, Inferior Occipital, Lingual Gyri; Cerebellum	20, 37, 19, 28, 17, 18	-57	-28	-22	4.53	0.01	1633
		-51	-63	-12	4.43	0.01	
		-50	-55	-17	4.31	0.01	
Bil Ventral Anterior, Medial Dorsal Nucleus of Thalamus		-6	-7	13	4.45	0.01	1481
		-2	-14	-1	4.17	0.01	
		12	-9	17	3.83	0.01	
White matter							
Main effect of diagnosis: FXS > TD/DD							
Rt Ventral, Dorsal Prefrontal Regions, Medial Temporal Regions		22	13	21	6.29	<0.001	4738
		22	22	12	5.81	<0.001	
		34	-43	-1	5.64	<0.001	
Lt Ventral, Dorsal Prefrontal Regions, Medial Temporal Regions		-34	-43	-3	5.92	<0.001	3019
		-34	-44	15	4.73	<0.001	
		-20	11	23	4.46	<0.001	
Main effect of diagnosis: TD/DD > FXS							
Rt Lateral Central Region		50	-10	34	5.4	<0.001	391
		53	-7	24	5.16	<0.001	

Table S2. Cont.

Brain regions	Brodmann area	Talairach coordinates			T value	Threshold (FDR)	Cluster size, voxels 1 × 1 × 1 mm
		X	Y	Z			
Lt Lateral Central Region		42	-7	22	5.04	<0.001	251
		-50	-12	32	4.78	<0.001	
		-50	-7	17	4.42	0.01	
		-59	-9	19	4.37	0.01	
Interaction: FXS (Time2 > Time1) > TD/DD (Time2 > Time1)							
Bil Ventral, Dorsal Prefrontal Regions, Medial Temporal Regions		-36	-49	-1	4.63	0.02	11101
		26	11	22	4.36	0.02	
		-20	13	27	4.2	0.02	
		-42	-9	-20	3.75	0.02	
Lt Medial Temporal Region		-42	-9	-20	3.75	0.02	347

Brain regions and Brodmann areas of only peak voxels are listed.