Analysis of Subcortical Volume Measures Between Random Groups - Comparing Regression Models With and Without Propensity Weights

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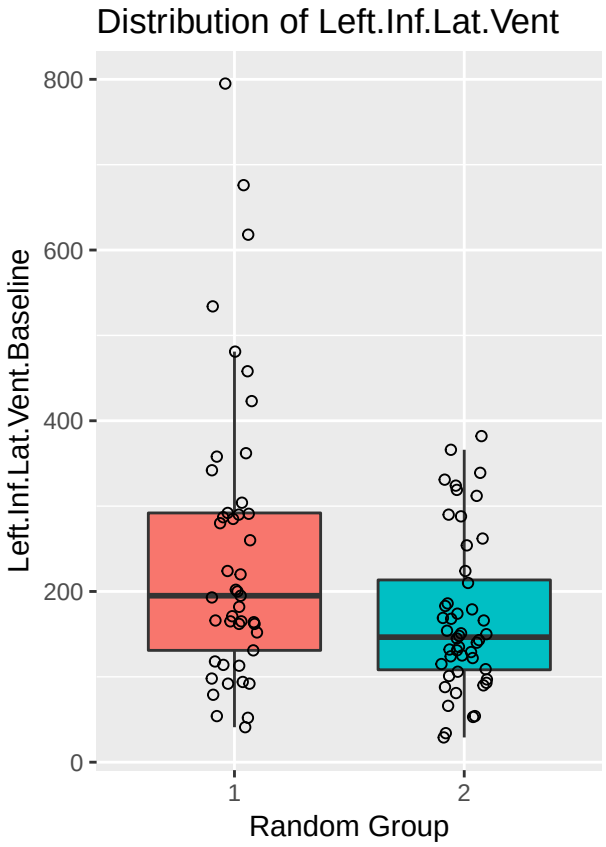
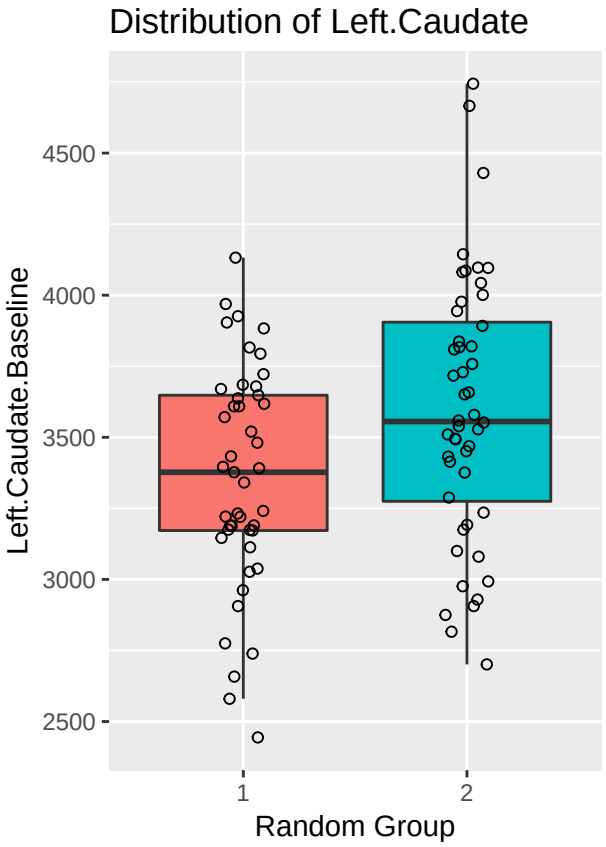
Baseline Differences in Subcortical Volume Measures Between Random Groups.

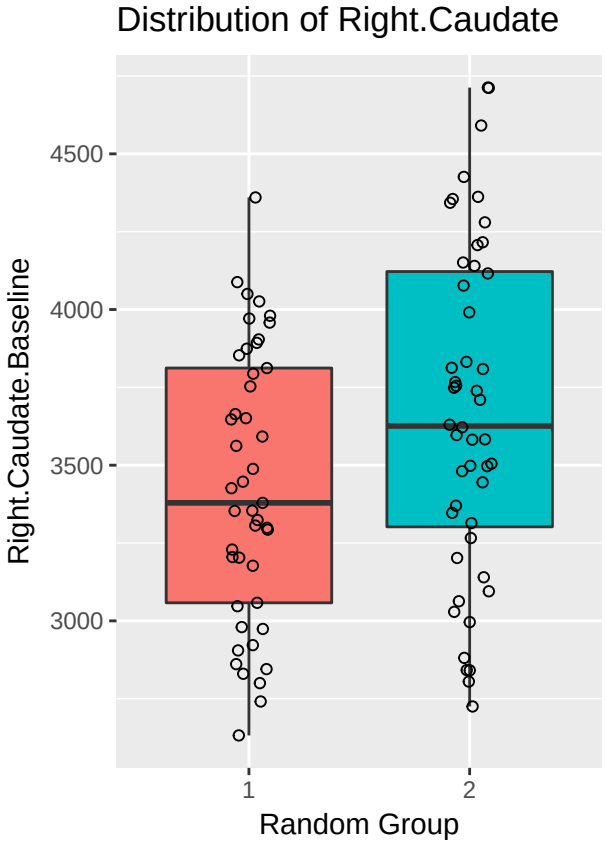
For a series of subcortical volume measures, both t-tests and the wilcoxon test were used to test for differences between the randomization groups The following table presents the mean, standard deviation, t-test p-value, and wilcoxon p-value for differences. The final column, "P.Value", gives the p-value for the random_group variable of the following regression model: sub_cor_measure_baseline = random_group + np_gender + IntraCranialVolume.x + np_age where sub_cor_measure_baseline is the subcortical volume measure being analyzed.

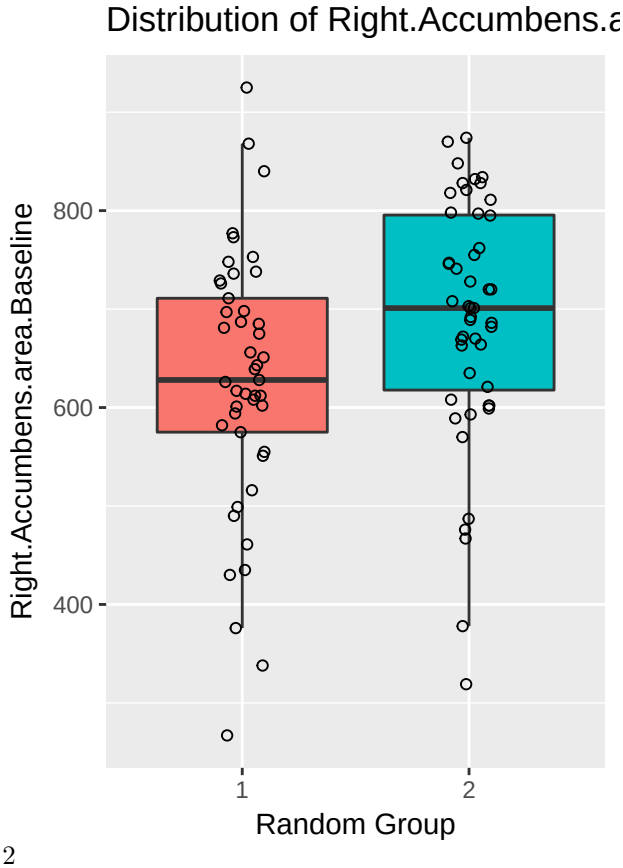
Variable	RG1 Mean	RG2 Mean	RG1 SD	RG2 SD	Wilcoxon Test	T.Test	P.Value
Left.Lateral.Ventricle	6611.56	6266.33	4870.41	3288.21	0.5685	0.6917	0.6623
Left.Inf.Lat.Vent	247.49	170.23	169.18	91.46	0.0258	0.0084	0.0072
Left.Cerebellum.White.Matter	15961.84	16440.02	4959.47	5282.53	0.553	0.6543	0.6589
Left.Cerebellum.Cortex	48854.69	51446.6	6339.98	7181.48	0.2126	0.069	0.0215
Left.Thalamus.Proper	7381.76	7405.96	1045.76	922.38	0.7643	0.9059	0.8928
Left.Caudate	3360.07	3597.08	391.54	467.72	0.0188	0.0097	0.0026
Left.Putamen	5289.24	5632.98	825.92	809.84	0.0654	0.0457	0.0122
Left.Pallidum	1565.4	1668.52	319.82	288.29	0.0837	0.1055	0.0548
X3rd.Ventricle	972.22	955.88	394.53	237.21	0.3787	0.8109	0.792
X4th.Ventricle	1958.38	1719.71	702.25	464.37	0.3139	0.0586	0.0326
Brain.Stem	20957.96	21365.31	2058.17	2741.2	0.4605	0.4222	0.304
Left.Hippocampus	4176.53	4204.25	472.84	509.17	0.6837	0.7866	0.7445
Left.Amygdala	1640.82	1628.33	223.54	248.41	0.715	0.7999	0.7775
CSF	1252.02	1252.25	310.53	228.87	0.7908	0.9968	0.9961
Left.Accumbens.area	563.76	612.06	173	123.98	0.327	0.1278	0.089
Left.VentralDC	3684.51	3808.69	482.93	474.64	0.3684	0.2144	0.0875
Right.Lateral.Ventricle	6716.53	5901.38	4935.03	2781.34	0.8146	0.3342	0.2776
Right.Inf.Lat.Vent	214.31	198.81	156.92	122.75	0.8356	0.5958	0.5952
Right.Cerebellum.White.Matter	15676.27	15783.08	4187.77	2872.17	0.4507	0.887	0.8858
Right.Cerebellum.Cortex	49883.16	51415.69	6570.8	6980.25	0.5958	0.2793	0.1669
Right.Thalamus.Proper	7138.13	7257.85	890.56	910.89	0.4699	0.5236	0.4518
Right.Caudate	3433.56	3671.04	435.73	532.97	0.0393	0.0213	0.0039
Right.Putamen	5024.38	5309.73	710.36	842.98	0.1064	0.0819	0.0205
Right.Pallidum	1478.87	1551.17	325.21	301.16	0.1527	0.2686	0.1943
Right.Hippocampus	4232.8	4322.96	588.1	445.4	0.5616	0.405	0.3662
Right.Amygdala	1760.47	1774.31	218.95	247.87	0.6837	0.7765	0.761
Right.Accumbens.area	627.22	689.98	133.82	123.91	0.0139	0.021	0.0061
Right.VentralDC	3759.56	3782.85	618.49	521.2	0.572	0.8444	0.7999
X5th.Ventricle	15.56	11.35	13.92	13.5	0.0586	0.1429	0.1365
WM.hypointensities	1815.67	1756.75	934.54	1502.55	0.1583	0.8198	0.8185
CC_Posterior	934.69	967.19	143.96	147.41	0.3195	0.2854	0.248
CC_Mid_Posterior	477.11	488.31	119.8	89.88	0.6391	0.6098	0.5767
CC_Central	523.07	526.1	147.01	104.75	0.5539	0.9095	0.8991
CC_Mid_Anterior	518.44	493.75	172.44	119.52	0.7439	0.4275	0.3587
CC_Anterior	854.71	888.44	166.58	147.5	0.1773	0.3033	0.2841

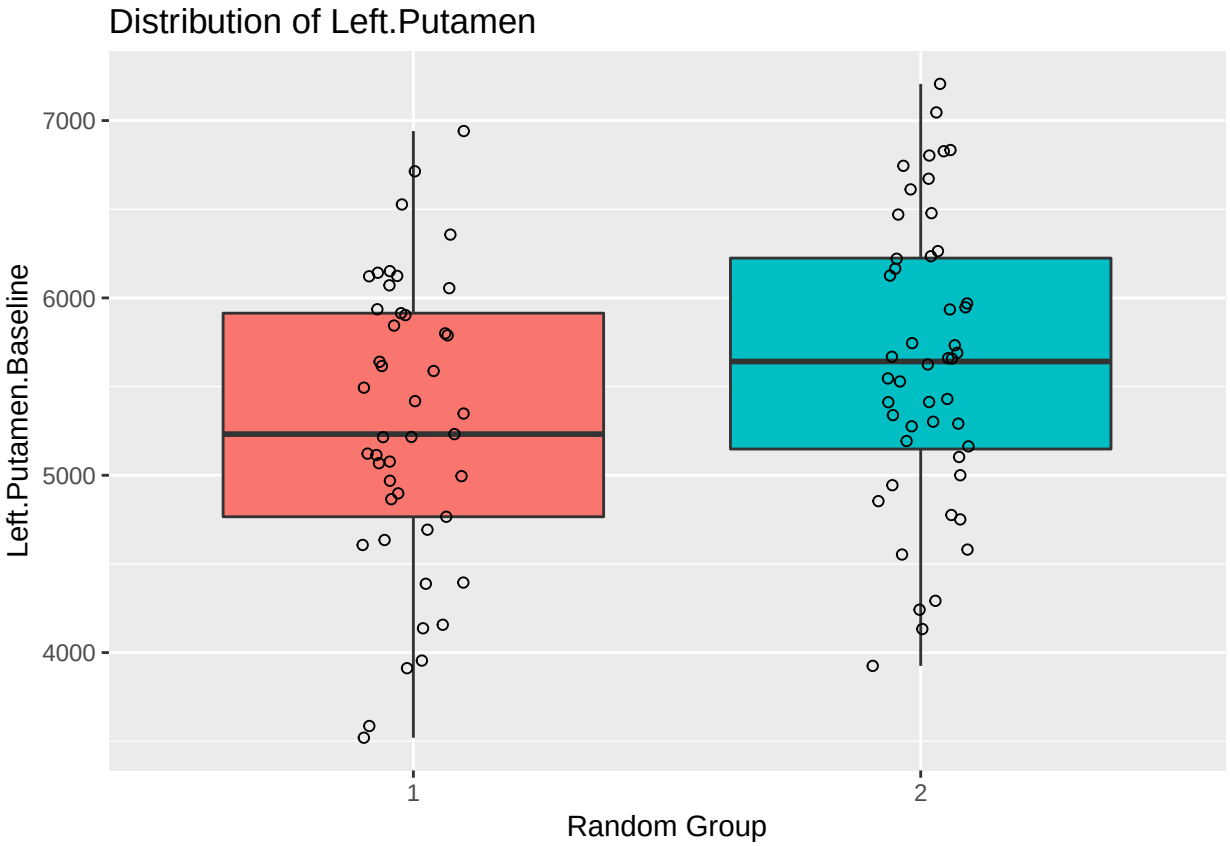
Distribution of Baseline Variables with Significant Difference Between Random Groups











Regression Models With Change Score of Subcortical Volume Measures as Outcome

The following table presents the mean change score for each subcortical volume measurement, stratified by random group, and the standard deviation. Then, a regreesion model was used to acquire p-values for the random_group variable: change_score = random_group + sub_cor_measure_baseline + IntraCranialVolume_post + np_age + np_gender where sub_cor_measure_baseline is the subcortical volume measure being analyzed. Each model was ran twice, one with and another without the propensity weights applied, and the p-values after multiple comparison correction are presented as well.

Variable	RG1 Mean Change	RG2 Mean Change	RG1 SD	RG2 SD	Pval.wo.weights	Pval.w.weights	Fdr.wo.weights	Fdr.w.weights
Left.Lateral.Ventricle	-176.33	-101.53	229.38	300.14	0.1881	0.4056	1	1
Left.Inf.Lat.Vent	4.88	-5.83	70.8	54.18	0.4291	0.1004	1	1
Left.Cerebellum.White.Matter	-497.62	260.3	6131.84	6041.15	0.5606	0.8819	1	1
Left.Cerebellum.Cortex	-823.48	2418.55	5983.62	6087.16	0.0142	0.0041	1	1
Left.Thalamus.Proper	-24.95	37.89	1069.52	968.86	0.7742	0.9383	1	1
Left.Caudate	-48.29	9.21	215.77	140.72	0.1256	0.1357	1	1
Left.Putamen	-2.69	137.09	528.21	423.86	0.1694	0.2082	1	1
Left.Pallidum	-19.64	-4.79	377.7	460.88	0.8696	0.7663	1	1
X3rd.Ventricle	0.95	-0.68	58.31	94.06	0.9213	0.6456	1	1
X4th.Ventricle	-122.45	-58.49	354.49	170.03	0.2693	0.1423	1	1
Brain.Stem	-336.5	-424.45	1101.67	1704.47	0.7749	0.7843	1	1
Left.Hippocampus	44.88	-17.47	226.36	384.81	0.3545	0.2096	1	1
Left.Amygdala	23.95	-14.6	161.15	189.33	0.3013	0.2397	1	1
CSF	-27.74	9.38	184.7	96.85	0.2138	0.1893	1	1
Left.Accumbens.area	26.6	29.72	167.53	121.27	0.9204	0.8917	1	1
Left.VentralDC	15.24	31.13	459.36	459.35	0.8698	0.4948	1	1

For this analysis, the p-values presented are of the interaction term between random_group and age at baseline. Regression Model: change_score = random_group*np_age + sub_cor_measure_baseline +

IntraCranialVolume_post + np_age + np_gender where sub_cor_measure_baseline is the subcortical volume measure being analyzed.

Variable	RG1 Mean Change	RG2 Mean Change	RG1 SD	RG2 SD	Pval.wo.weights	Pval.w.weights	Fdr.wo.weights	Fdr.w.weights
Left.Lateral.Ventricle	-176.33	-101.53	229.38	300.14	0.1895	0.4049	1	1
Left.Inf.Lat.Vent	4.88	-5.83	70.8	54.18	0.4237	0.0834	1	1
Left.Cerebellum.White.Matter	-497.62	260.3	6131.84	6041.15	0.4107	0.8176	1	1
Left.Cerebellum.Cortex	-823.48	2418.55	5983.62	6087.16	0.0048	8e-04	1	1
Left.Thalamus.Proper	-24.95	37.89	1069.52	968.86	0.7381	0.9292	1	1
Left.Caudate	-48.29	9.21	215.77	140.72	0.0953	0.092	1	1
Left.Putamen	-2.69	137.09	528.21	423.86	0.1321	0.1658	1	1
Left.Pallidum	-19.64	-4.79	377.7	460.88	0.8559	0.7366	1	1
X3rd.Ventricle	0.95	-0.68	58.31	94.06	0.9197	0.6365	1	1
X4th.Ventricle	-122.45	-58.49	354.49	170.03	0.2565	0.1358	1	1
Brain.Stem	-336.5	-424.45	1101.67	1704.47	0.7518	0.765	1	1
Left.Hippocampus	44.88	-17.47	226.36	384.81	0.243	0.1055	1	1
Left.Amygdala	23.95	-14.6	161.15	189.33	0.2243	0.1653	1	1
CSF	-27.74	9.38	184.7	96.85	0.2118	0.1855	1	1
Left.Accumbens.area	26.6	29.72	167.53	121.27	0.9126	0.8798	1	1
Left.VentralDC	15.24	31.13	459.36	459.35	0.8523	0.4367	1	1
Right.Lateral.Ventricle	-162.62	-62.57	281.25	284.77	0.1077	0.1628	1	1
Right.Inf.Lat.Vent	1.07	-14.11	48.36	39.82	0.1105	0.0461	1	1
Right.Cerebellum.White.Matter	-852.86	752.81	7193.4	3283.7	0.1109	0.1916	1	1
Right.Cerebellum.Cortex	-1102.62	847.06	7268.68	5431.71	0.1223	0.0308	1	1
Right.Thalamus.Proper	-32.12	59.43	905.01	778.4	0.4987	0.3295	1	1
Right.Caudate	-55.48	45.96	164.89	200.83	0.0088	0.011	1	1
Right.Putamen	-18.14	-61.13	395.04	440.72	0.5823	0.4773	1	1
Right.Pallidum	-192.88	-30.38	898.3	246.02	0.1807	0.1644	1	1
Right.Hippocampus	37.55	57.34	409.89	226.97	0.7308	0.9719	1	1
Right.Amygdala	15.57	-4.13	211.36	221.53	0.6352	0.2826	1	1
Right.Accumbens.area	20.6	19.87	82.73	79.82	0.9645	0.9513	1	1
Right.VentralDC	21.88	21.7	536.47	549.2	0.9985	0.9464	1	1
X5th.Ventricle	0.86	1.81	9.42	7.29	0.5845	0.4062	1	1
WM.hypointensities	-4.93	122.23	651.11	1484.28	0.4364	0.5515	1	1
CC_Posterior	5.64	5.34	35.67	32.27	0.9668	0.7677	1	1
CC_Mid_Posterior	13.6	7.09	35.79	40.5	0.4002	0.347	1	1
CC_Central	10.83	16.28	90.94	46.26	0.7149	0.7315	1	1
CC_Mid_Anterior	13.19	1.68	103.39	38.71	0.4597	0.6017	1	1
CC_Anterior	2.36	7.57	60.67	36	0.6021	0.5751	1	1

After applying the multiple comparison adjustment, none of the interaction effect terms were significant.