

Supplementary Materials

Supplementary Materials 1 - Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 2 - Results of Linear Mixed-Effects Models for Baseline Brain Regions

Supplementary Materials 3 - Results of Linear Mixed-Effects Models for Behavior and Cognition

Supplementary Materials 4 - Results of Longitudinal Linear Mixed Effects Models

Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 1

U1 ~ group + Sex + GestAge + ICs + (1|site)

U 1 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.81	-1.45 – -0.16	0.015
Sex	0.08	-0.01 – 0.17	0.071
groupnew [pre A]	0.05	-0.04 – 0.14	0.259
groupnew [pre B]	0.01	-0.15 – 0.16	0.931
GestAge	0.01	-0.00 – 0.01	0.053
ICs	0.33	0.29 – 0.38	<0.001
Random Effects			
σ^2	0.81		
τ_{00} site	0.05		
ICC	0.05		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.111 / 0.158		

V1 ~ group + Sex + GestAge + (1|site)

V 1 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.65	-1.33 – 0.03	0.061
Sex	-0.16	-0.24 – -0.08	<0.001
groupnew [pre A]	0.08	-0.02 – 0.17	0.103
groupnew [pre B]	-0.01	-0.17 – 0.15	0.936
GestAge	0.01	0.00 – 0.01	0.016
Random Effects			
σ^2	0.87		
τ_{00} site	0.10		
ICC	0.10		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.012 / 0.115		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 1

U2 ~ group + Sex + GestAge + ICs + (1|site)

U 2 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.16	-0.83 – 0.51	0.637
Sex	0.10	0.01 – 0.19	0.038
groupnew [pre A]	0.06	-0.04 – 0.15	0.248
groupnew [pre B]	0.29	0.13 – 0.45	<0.001
GestAge	-0.00	-0.01 – 0.01	0.965
ICs	-0.29	-0.34 – -0.24	<0.001
Random Effects			
σ ²	0.88		
τ ₀₀ site	0.03		
ICC	0.03		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.106 / 0.136		

V2 ~ group + Sex + GestAge + (1|site)

V 2 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.38	-1.08 – 0.31	0.276
Sex	0.29	0.21 – 0.38	<0.001
groupnew [pre A]	0.04	-0.06 – 0.14	0.404
groupnew [pre B]	0.44	0.27 – 0.61	<0.001
GestAge	-0.00	-0.01 – 0.01	0.837
Random Effects			
σ ²	0.94		
τ ₀₀ site	0.03		
ICC	0.03		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.034 / 0.063		

Green line highlights
significant GA-related results

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 1

U3 ~ group + Sex + GestAge + ICs + (1|site)

U 3 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.30	-0.98 – 0.38	0.381
Sex	0.04	-0.05 – 0.14	0.339
groupnew [pre A]	0.06	-0.04 – 0.15	0.227
groupnew [pre B]	0.07	-0.10 – 0.23	0.431
GestAge	0.00	-0.00 – 0.01	0.555
ICs	-0.31	-0.36 – -0.26	<0.001
Random Effects			
σ ²	0.89		
τ ₀₀ site	0.05		
ICC	0.06		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.099 / 0.151		

V3 ~ group + Sex + GestAge + (1|site)

V 3 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.15	-0.85 – 0.55	0.667
Sex	0.24	0.15 – 0.32	<0.001
groupnew [pre A]	0.00	-0.10 – 0.10	0.988
groupnew [pre B]	0.09	-0.07 – 0.26	0.267
GestAge	-0.00	-0.01 – 0.00	0.562
Random Effects			
σ ²	0.95		
τ ₀₀ site	0.04		
ICC	0.04		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.015 / 0.056		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 1

U4 ~ group + Sex + GestAge + ICs + (1|site)

U 4 scores			
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	0.63	0.01 – 1.26	0.048
Sex	0.13	0.05 – 0.20	0.001
groupnew [pre A]	-0.01	-0.09 – 0.07	0.745
groupnew [pre B]	0.09	-0.04 – 0.22	0.177
GestAge	-0.01	-0.01 – -0.00	0.009
ICs	0.06	0.02 – 0.10	0.006
Random Effects			
σ^2	0.59		
τ_{00} site	0.51		
ICC	0.47		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.006 / 0.469		

V4 ~ group + Sex + GestAge + (1|site)

V 4 scores			
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	0.19	-0.40 – 0.78	0.531
Sex	0.01	-0.05 – 0.06	0.869
groupnew [pre A]	0.04	-0.03 – 0.11	0.298
groupnew [pre B]	0.01	-0.11 – 0.13	0.914
GestAge	-0.00	-0.00 – 0.00	0.675
Random Effects			
σ^2	0.48		
τ_{00} site	0.61		
ICC	0.56		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.000 / 0.558		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 1

U5 ~ group + Sex + GestAge + ICs + (1|site)

U 5 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.54	-1.17 – 0.08	0.087
Sex	0.07	-0.01 – 0.16	0.087
groupnew [pre A]	0.07	-0.02 – 0.16	0.118
groupnew [pre B]	0.19	0.04 – 0.34	0.013
GestAge	0.00	-0.00 – 0.01	0.203
ICs	-0.45	-0.50 – -0.41	<0.001
Random Effects			
σ ²	0.77		
τ ₀₀ site	0.01		
ICC	0.01		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.223 / 0.234		

V5 ~ group + Sex + GestAge + (1|site)

V 5 scores			
Predictors	Estimates	CI	p
(Intercept)	0.25	-0.44 – 0.94	0.471
Sex	0.36	0.28 – 0.44	<0.001
groupnew [pre A]	0.10	0.00 – 0.20	0.041
groupnew [pre B]	0.27	0.10 – 0.43	0.002
GestAge	-0.01	-0.01 – -0.00	0.017
Random Effects			
σ ²	0.94		
τ ₀₀ site	0.02		
ICC	0.02		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.040 / 0.059		

Green line highlights
significant GA-related results

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 1

U6 ~ group + Sex + GestAge + ICs + (1|site)

U 6 scores			
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	1.32	0.62 – 2.01	<0.001
Sex	-0.28	-0.37 – -0.19	<0.001
groupnew [pre A]	-0.06	-0.16 – 0.03	0.202
groupnew [pre B]	-0.10	-0.26 – 0.07	0.256
GestAge	-0.01	-0.01 – -0.00	0.011
ICs	-0.12	-0.17 – -0.07	<0.001
Random Effects			
σ^2	0.94		
τ_{00} site	0.05		
ICC	0.05		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.024 / 0.074		

V6 ~ group + Sex + GestAge + (1|site)

V 6 scores			
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	0.98	0.29 – 1.68	0.005
Sex	-0.18	-0.26 – -0.10	<0.001
groupnew [pre A]	-0.01	-0.11 – 0.08	0.773
groupnew [pre B]	0.01	-0.16 – 0.17	0.934
GestAge	-0.01	-0.01 – -0.00	0.034
Random Effects			
σ^2	0.90		
τ_{00} site	0.11		
ICC	0.11		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.010 / 0.117		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Supplementary
Materials 1

Results of Linear Mixed-Effects Models for Canonical Variates

U7 ~ group + Sex + GestAge + ICs + (1|site)

V7 ~ group + Sex + GestAge + (1|site)

U 7 scores			
Predictors	Estimates	CI	p
(Intercept)	0.42	-0.27 – 1.11	0.235
Sex	0.10	0.01 – 0.19	0.037
groupnew [pre A]	0.01	-0.09 – 0.10	0.898
groupnew [pre B]	0.28	0.12 – 0.45	0.001
GestAge	-0.00	-0.01 – 0.00	0.092
ICs	0.27	0.22 – 0.32	<0.001
Random Effects			
σ ²	0.91		
τ ₀₀ site	0.07		
ICC	0.07		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.061 / 0.125		

V 7 scores			
Predictors	Estimates	CI	p
(Intercept)	0.65	-0.05 – 1.35	0.071
Sex	-0.08	-0.16 – 0.00	0.063
groupnew [pre A]	0.07	-0.03 – 0.17	0.174
groupnew [pre B]	0.16	-0.00 – 0.33	0.055
GestAge	-0.00	-0.01 – 0.00	0.106
Random Effects			
σ ²	0.94		
τ ₀₀ site	0.07		
ICC	0.07		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.004 / 0.071		

Green line highlights
significant GA-related results

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Linear Mixed-Effects Models for Canonical Variates

Supplementary Materials 1

U8 ~ group + Sex + GestAge + ICs + (1|site)

U 8 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.13	-0.83 – 0.57	0.720
Sex	-0.03	-0.13 – 0.06	0.482
groupnew [pre A]	-0.14	-0.24 – -0.04	0.005
groupnew [pre B]	-0.11	-0.28 – 0.06	0.191
GestAge	0.00	-0.00 – 0.01	0.526
ICs	-0.15	-0.20 – -0.10	<0.001
Random Effects			
σ ²	0.95		
τ ₀₀ site	0.04		
ICC	0.04		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.024 / 0.061		

V8 ~ group + Sex + GestAge + (1|site)

V 8 scores			
Predictors	Estimates	CI	p
(Intercept)	-0.19	-0.89 – 0.51	0.588
Sex	0.04	-0.05 – 0.12	0.405
groupnew [pre A]	-0.23	-0.32 – -0.13	<0.001
groupnew [pre B]	-0.09	-0.26 – 0.08	0.288
GestAge	0.00	-0.00 – 0.01	0.568
Random Effects			
σ ²	0.96		
τ ₀₀ site	0.03		
ICC	0.03		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.011 / 0.041		

Green line highlights significant GA-related results

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Linear Mixed-Effects Models for Baseline Brain Regions

Supplementary Materials 2

GM volume ~ group + Sex + GestAge + ICs + (1|site)

smri vol scs tplh			
Predictors	Estimates	CI	p
(Intercept)	7443.88	7055.44 – 7832.33	<0.001
Sex	-88.94	-141.44 – -36.45	0.001
groupnew [pre A]	-82.16	-136.85 – -27.48	0.003
groupnew [pre B]	-154.86	-248.02 – -61.69	0.001
GestAge	4.28	1.11 – 7.45	0.008
ICs	532.59	504.96 – 560.23	<0.001
Random Effects			
σ ²	294062.22		
τ ₀₀ site	9992.63		
ICC	0.03		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.507 / 0.524		

smri vol scs putamenrh			
Predictors	Estimates	CI	p
(Intercept)	5568.83	5239.37 – 5898.29	<0.001
Sex	-165.37	-209.93 – -120.80	<0.001
groupnew [pre A]	-65.77	-112.11 – -19.43	0.005
groupnew [pre B]	6.64	-72.45 – 85.73	0.869
GestAge	1.12	-1.57 – 3.81	0.415
ICs	299.06	275.64 – 322.49	<0.001
Random Effects			
σ ²	212112.61		
τ ₀₀ site	6306.50		
ICC	0.03		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.352 / 0.370		

smri vol cdk cdacatelh			
Predictors	Estimates	CI	p
(Intercept)	2246.10	1860.80 – 2631.40	<0.001
Sex	87.52	34.85 – 140.20	0.001
groupnew [pre A]	6.25	-45.72 – 58.22	0.814
groupnew [pre B]	45.66	-47.75 – 139.06	0.338
GestAge	-1.67	-4.84 – 1.50	0.302
ICs	220.65	193.98 – 247.31	<0.001
Random Effects			
σ ²	302781.19		
τ ₀₀ site	410.82		
ICC	0.00		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.120 / 0.121		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Green line highlights
significant results

Supplementary Materials 2

Results of Linear Mixed-Effects Models for Baseline Brain Regions

GM volume ~ group + Sex + GestAge + ICs + (1|site)

smri vol cdk mobfrrh				smri vol cdk sufrrh				smri vol cdk rracatelh			
Predictors	Estimates	CI	p	Predictors	Estimates	CI	p	Predictors	Estimates	CI	p
(Intercept)	7577.88	7130.91 – 8024.86	<0.001	(Intercept)	31401.06	29479.37 – 33322.75	<0.001	(Intercept)	3585.69	3220.16 – 3951.22	<0.001
Sex	-24.24	-83.25 – 34.77	0.421	Sex	-300.36	-554.13 – -46.58	0.020	Sex	32.31	-17.11 – 81.74	0.200
groupnew [pre A]	20.02	-42.21 – 82.25	0.528	groupnew [pre A]	-140.13	-407.77 – 127.50	0.305	groupnew [pre A]	-90.93	-142.36 – -39.49	0.001
groupnew [pre B]	-17.38	-122.12 – 87.37	0.745	groupnew [pre B]	-425.26	-875.75 – 25.22	0.064	groupnew [pre B]	-98.95	-186.66 – -11.24	0.027
GestAge	-6.54	-10.10 – -2.98	<0.001	GestAge	-19.85	-35.17 – -4.53	0.011	GestAge	-3.62	-6.60 – -0.64	0.017
ICs	507.11	475.73 – 538.49	<0.001	ICs	2205.34	2070.38 – 2340.30	<0.001	ICs	350.65	324.65 – 376.65	<0.001
Random Effects				Random Effects				Random Effects			
σ²	369447.47			σ²	6833822.88			σ²	260772.38		
τ₀₀ site	60548.17			τ₀₀ site	1105528.76			τ₀₀ site	8250.70		
ICC	0.14			ICC	0.14			ICC	0.03		
N _{site}	22			N _{site}	22			N _{site}	22		
Observations	2130			Observations	2130			Observations	2130		
Marginal R² / Conditional R²	0.379 / 0.467			Marginal R² / Conditional R²	0.396 / 0.480			Marginal R² / Conditional R²	0.308 / 0.330		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Green line highlights
significant results

Results of Linear Mixed-Effects Models for Baseline Brain Regions

Supplementary Materials 2

GM volume ~ group + Sex + GestAge + ICs + (1|site)

smri vol cdk lobfrrh			
Predictors	Estimates	CI	p
(Intercept)	10084.96	9488.42 – 10681.51	<0.001
Sex	-22.67	-98.33 – 52.99	0.557
groupnew [pre A]	-46.22	-126.22 – 33.78	0.257
groupnew [pre B]	-146.19	-280.51 – -11.87	0.033
GestAge	-8.15	-12.72 – -3.59	<0.001
ICs	763.91	723.59 – 804.24	<0.001
Random Effects			
σ ²	606742.96		
τ ₀₀ site	253406.07		
ICC	0.29		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.408 / 0.583		

smri vol scs putamenrh			
Predictors	Estimates	CI	p
(Intercept)	5568.83	5239.37 – 5898.29	<0.001
Sex	-165.37	-209.93 – -120.80	<0.001
groupnew [pre A]	-65.77	-112.11 – -19.43	0.005
groupnew [pre B]	6.64	-72.45 – 85.73	0.869
GestAge	1.12	-1.57 – 3.81	0.415
ICs	299.06	275.64 – 322.49	<0.001
Random Effects			
σ ²	212112.61		
τ ₀₀ site	6306.50		
ICC	0.03		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.352 / 0.370		

smri vol scs crbcortexrh			
Predictors	Estimates	CI	p
(Intercept)	59343.42	56119.77 – 62567.07	<0.001
Sex	-1919.31	-2348.87 – -1489.76	<0.001
groupnew [pre A]	-384.32	-836.48 – 67.83	0.096
groupnew [pre B]	-1234.02	-1996.51 – -471.54	0.002
GestAge	14.11	-11.83 – 40.04	0.286
ICs	3712.42	3484.34 – 3940.50	<0.001
Random Effects			
σ ²	19596430.54		
τ ₀₀ site	2136435.64		
ICC	0.10		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.456 / 0.509		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Green line highlights
significant results

Supplementary
Materials 2

Results of Linear Mixed-Effects Models for Baseline Brain Regions

GM volume ~ group + Sex + GestAge + ICs + (1|site)

	smri vol cdk parstgrish		
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	6773.12	6134.45 – 7411.78	<0.001
Sex	-202.45	-289.31 – -115.58	<0.001
groupnew [pre A]	-105.81	-194.48 – -17.14	0.019
groupnew [pre B]	-186.02	-340.14 – -31.91	0.018
GestAge	-4.85	-10.08 – 0.39	0.070
ICs	307.93	262.91 – 352.96	<0.001
Random Effects			
σ ²	812234.99		
τ ₀₀ site	8433.70		
ICC	0.01		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.144 / 0.153		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Green line highlights
significant results

Supplementary
Materials 2

Results of Linear Mixed-Effects Models for Baseline Brain Regions

FA ~ group + Sex + GestAge + (1|site)

dmdtifp 1 29				dmdtifp 1 25				dmdtifp 1 389			
Predictors	Estimates	CI	p	Predictors	Estimates	CI	p	Predictors	Estimates	CI	p
(Intercept)	0.40	0.38 – 0.42	<0.001	(Intercept)	0.40	0.38 – 0.42	<0.001	(Intercept)	0.31	0.27 – 0.35	<0.001
Sex	0.00	-0.00 – 0.00	0.193	Sex	0.00	-0.00 – 0.00	0.372	Sex	0.01	0.00 – 0.01	<0.001
groupnew [pre A]	0.00	-0.00 – 0.00	0.475	groupnew [pre A]	-0.00	-0.00 – 0.00	0.251	groupnew [pre A]	0.00	-0.00 – 0.01	0.150
groupnew [pre B]	-0.00	-0.01 – 0.00	0.420	groupnew [pre B]	0.00	-0.00 – 0.01	0.898	groupnew [pre B]	0.02	0.01 – 0.02	<0.001
GestAge	0.00	0.00 – 0.00	<0.001	GestAge	0.00	0.00 – 0.00	<0.001	GestAge	0.00	-0.00 – 0.00	0.195
Random Effects				Random Effects				Random Effects			
σ ²	0.00			σ ²	0.00			σ ²	0.00		
τ ₀₀ site	0.00			τ ₀₀ site	0.00			τ ₀₀ site	0.00		
ICC	0.37			ICC	0.43			ICC	0.31		
N _{site}	22			N _{site}	22			N _{site}	22		
Observations	2130			Observations	2130			Observations	2130		
Marginal R ² / Conditional R ²	0.008 / 0.372			Marginal R ² / Conditional R ²	0.011 / 0.440			Marginal R ² / Conditional R ²	0.012 / 0.318		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Green line highlights
significant results

Results of Linear Mixed-Effects Models for Baseline Brain Regions

Supplementary Materials 2

FA ~ group + Sex + GestAge + (1|site)

dmdtifp 1 20			
Predictors	Estimates	CI	p
(Intercept)	0.43	0.40 – 0.45	<0.001
Sex	-0.00	-0.00 – 0.00	0.387
groupnew [pre A]	-0.00	-0.01 – 0.00	0.108
groupnew [pre B]	0.00	-0.00 – 0.01	0.210
GestAge	0.00	0.00 – 0.00	<0.001
Random Effects			
σ ²	0.00		
τ _{00 site}	0.00		
ICC	0.46		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.009 / 0.465		

dmdtifp 1 216			
Predictors	Estimates	CI	p
(Intercept)	0.27	0.26 – 0.29	<0.001
Sex	-0.00	-0.00 – 0.00	0.053
groupnew [pre A]	-0.00	-0.00 – 0.00	0.060
groupnew [pre B]	-0.00	-0.01 – -0.00	0.020
GestAge	0.00	0.00 – 0.00	<0.001
Random Effects			
σ ²	0.00		
τ _{00 site}	0.00		
ICC	0.65		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.005 / 0.647		

dmdtifp 1 26			
Predictors	Estimates	CI	p
(Intercept)	0.42	0.39 – 0.44	<0.001
Sex	0.00	0.00 – 0.01	0.009
groupnew [pre A]	0.00	-0.00 – 0.00	0.689
groupnew [pre B]	0.00	-0.00 – 0.01	0.339
GestAge	0.00	0.00 – 0.00	<0.001
Random Effects			
σ ²	0.00		
τ _{00 site}	0.00		
ICC	0.48		
N _{site}	22		
Observations	2130		
Marginal R ² / Conditional R ²	0.008 / 0.488		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Green line highlights
significant results

Supplementary
Materials 2

Results of Linear Mixed-Effects Models for Baseline Brain Regions

FA ~ group + Sex + GestAge + (1|site)

dmdtifp 1 34				dmdtifp 1 21				dmdtifp 1 357			
Predictors	Estimates	CI	p	Predictors	Estimates	CI	p	Predictors	Estimates	CI	p
(Intercept)	0.40	0.38 – 0.42	<0.001	(Intercept)	0.43	0.41 – 0.45	<0.001	(Intercept)	0.27	0.25 – 0.29	<0.001
Sex	0.00	0.00 – 0.01	<0.001	Sex	0.00	-0.00 – 0.00	0.917	Sex	0.01	0.00 – 0.01	<0.001
groupnew [pre A]	-0.00	-0.00 – 0.00	0.791	groupnew [pre A]	-0.00	-0.00 – 0.00	0.289	groupnew [pre A]	-0.00	-0.00 – 0.00	0.499
groupnew [pre B]	0.00	-0.00 – 0.01	0.366	groupnew [pre B]	-0.00	-0.01 – 0.00	0.951	groupnew [pre B]	0.00	-0.00 – 0.01	0.355
GestAge	0.00	0.00 – 0.00	<0.001	GestAge	0.00	0.00 – 0.00	<0.001	GestAge	0.00	0.00 – 0.00	<0.001
Random Effects				Random Effects				Random Effects			
σ²	0.00			σ²	0.00			σ²	0.00		
τ₀₀ site	0.00			τ₀₀ site	0.00			τ₀₀ site	0.00		
ICC	0.45			ICC	0.41			ICC	0.47		
N _{site}	22			N _{site}	22			N _{site}	22		
Observations	2130			Observations	2130			Observations	2130		
Marginal R² / Conditional R²	0.008 / 0.453			Marginal R² / Conditional R²	0.011 / 0.416			Marginal R² / Conditional R²	0.013 / 0.476		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Supplementary
Materials 2

Results of Linear Mixed-Effects Models for Baseline Brain Regions

FA ~ group + Sex + GestAge + (1|site)

dmdtifp 1 31				dmdtifp 1 30				dmdtifp 1 366			
Predictors	Estimates	CI	p	Predictors	Estimates	CI	p	Predictors	Estimates	CI	p
(Intercept)	0.42	0.39 – 0.44	<0.001	(Intercept)	0.43	0.41 – 0.46	<0.001	(Intercept)	0.39	0.35 – 0.42	<0.001
Sex	0.00	0.00 – 0.01	0.001	Sex	0.00	0.00 – 0.01	0.002	Sex	0.01	0.00 – 0.01	0.007
groupnew [pre A]	0.00	0.00 – 0.01	0.042	groupnew [pre A]	0.00	-0.00 – 0.00	0.451	groupnew [pre A]	-0.00	-0.01 – -0.00	0.046
groupnew [pre B]	0.00	0.00 – 0.01	0.047	groupnew [pre B]	0.00	-0.00 – 0.01	0.059	groupnew [pre B]	-0.01	-0.02 – 0.00	0.096
GestAge	0.00	0.00 – 0.00	<0.001	GestAge	0.00	0.00 – 0.00	<0.001	GestAge	0.00	-0.00 – 0.00	0.056
Random Effects				Random Effects				Random Effects			
σ²	0.00			σ²	0.00			σ²	0.00		
τ₀₀ site	0.00			τ₀₀ site	0.00			τ₀₀ site	0.00		
ICC	0.37			ICC	0.45			ICC	0.36		
N _{site}	22			N _{site}	22			N _{site}	22		
Observations	2130			Observations	2130			Observations	2130		
Marginal R² / Conditional R²	0.013 / 0.383			Marginal R² / Conditional R²	0.010 / 0.457			Marginal R² / Conditional R²	0.005 / 0.367		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Green line highlights
significant results

Supplementary
Materials 3

Results of Linear Mixed-Effects Models for Behavior

Behavior ~ group + Sex + GestAge + (1|site)

internalizing			
Predictors	Estimates	CI	p
(Intercept)	2.54	-1.24 – 6.32	0.187
groupnew [pre A]	-0.09	-0.62 – 0.44	0.735
groupnew [pre B]	0.45	-0.45 – 1.36	0.327
GestAge	0.02	-0.01 – 0.05	0.263
Sex	0.16	-0.29 – 0.62	0.484
Random Effects			
σ ²	28.17		
τ ₀₀ site	0.48		
ICC	0.02		
N _{site}	22		
Observations	2129		
Marginal R ² / Conditional R ²	0.001 / 0.018		

externalizing			
Predictors	Estimates	CI	p
(Intercept)	8.22	4.37 – 12.08	<0.001
groupnew [pre A]	0.37	-0.17 – 0.91	0.176
groupnew [pre B]	-0.04	-0.96 – 0.89	0.937
GestAge	-0.02	-0.05 – 0.01	0.231
Sex	-1.22	-1.68 – -0.75	<0.001
Random Effects			
σ ²	29.28		
τ ₀₀ site	0.56		
ICC	0.02		
N _{site}	22		
Observations	2129		
Marginal R ² / Conditional R ²	0.014 / 0.032		

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age

Results of Linear Mixed-Effects Models for Cognition

Cognition ~ group + Sex + GestAge + (1|site)

Green line highlights
significant results

Fluid			
Predictors	Estimates	CI	p
(Intercept)	48.34	41.20 – 55.47	<0.001
Sex [Male]	-1.43	-2.30 – -0.56	0.001
groupnew [pre A]	-1.44	-2.46 – -0.41	0.006
groupnew [pre B]	-5.33	-7.07 – -3.59	<0.001
GestAge	0.37	0.32 – 0.43	<0.001
Random Effects			
σ ²	100.73		
τ ₀₀ site	4.02		
ICC	0.04		
N _{site}	22		
Observations	2088		
Marginal R ² / Conditional R ²	0.081 / 0.116		

Crystalized			
Predictors	Estimates	CI	p
(Intercept)	59.97	55.26 – 64.69	<0.001
Sex [Male]	0.11	-0.46 – 0.68	0.706
groupnew [pre A]	-1.44	-2.12 – -0.76	<0.001
groupnew [pre B]	-4.02	-5.16 – -2.88	<0.001
GestAge	0.23	0.19 – 0.27	<0.001
Random Effects			
σ ²	43.96		
τ ₀₀ site	2.38		
ICC	0.05		
N _{site}	22		
Observations	2102		
Marginal R ² / Conditional R ²	0.071 / 0.119		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Supplementary
Materials 3

Results of Linear Mixed-Effects Models for Cognition
Cognition ~ GM volume + Sex + GestAge + ICs + (1|site)

Green line highlights
significant results

Fluid				Crystalized			
Predictors	Estimates	CI	p	Predictors	Estimates	CI	p
(Intercept)	39.12	30.24 – 47.99	<0.001	(Intercept)	52.14	46.49 – 57.80	<0.001
smri vol scs crbcortexrh	0.00	0.00 – 0.00	<0.001	smri vol scs crbcortexrh	0.00	0.00 – 0.00	<0.001
Sex [Male]	-3.28	-4.27 – -2.29	<0.001	Sex [Male]	-2.23	-2.86 – -1.60	<0.001
GestAge	0.36	0.30 – 0.42	<0.001	GestAge	0.20	0.16 – 0.24	<0.001
ICs	1.09	0.46 – 1.71	0.001	ICs	1.48	1.09 – 1.88	<0.001
Random Effects				Random Effects			
σ ²	99.85			σ ²	40.48		
τ ₀₀ site	3.78			τ ₀₀ site	2.42		
ICC	0.04			ICC	0.06		
N _{site}	22			N _{site}	22		
Observations	2100			Observations	2114		
Marginal R ² / Conditional R ²	0.101 / 0.134			Marginal R ² / Conditional R ²	0.147 / 0.195		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Supplementary
Materials 3

Results of Linear Mixed-Effects Models for Cognition
Cognition ~ GM volume + Sex + GestAge + ICs + (1|site)

Green line highlights
significant results

Fluid			
Predictors	Estimates	CI	p
(Intercept)	44.92	37.20 – 52.64	<0.001
smri vol cdk rracatelh	0.00	0.00 – 0.00	0.001
Sex [Male]	-2.85	-3.83 – -1.88	<0.001
GestAge	0.37	0.31 – 0.43	<0.001
ICs	1.32	0.73 – 1.91	<0.001
Random Effects			
σ ²	99.98		
τ ₀₀ site	4.38		
ICC	0.04		
N _{site}	22		
Observations	2100		
Marginal R ² / Conditional R ²	0.099 / 0.137		

Crystalized			
Predictors	Estimates	CI	p
(Intercept)	61.01	56.05 – 65.96	<0.001
smri vol cdk rracatelh	0.00	0.00 – 0.00	0.011
Sex [Male]	-1.82	-2.45 – -1.20	<0.001
GestAge	0.20	0.17 – 0.24	<0.001
ICs	2.00	1.62 – 2.38	<0.001
Random Effects			
σ ²	41.12		
τ ₀₀ site	2.83		
ICC	0.06		
N _{site}	22		
Observations	2114		
Marginal R ² / Conditional R ²	0.134 / 0.190		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Supplementary
Materials 3

Results of Linear Mixed-Effects Models for Cognition
Cognition ~ GM volume + Sex + GestAge + ICs + (1|site)

Fluid			
Predictors	Estimates	CI	p
(Intercept)	44.25	35.09 – 53.42	<0.001
smri vol scs tplh	0.00	0.00 – 0.00	0.047
Sex [Male]	-2.97	-3.95 – -1.99	<0.001
GestAge	0.36	0.30 – 0.42	<0.001
ICs	1.38	0.72 – 2.05	<0.001
Random Effects			
σ ²	100.33		
τ ₀₀ site	4.28		
ICC	0.04		
N _{site}	22		
Observations	2100		
Marginal R ² / Conditional R ²	0.096 / 0.133		

Crystalized			
Predictors	Estimates	CI	p
(Intercept)	58.89	53.03 – 64.76	<0.001
smri vol scs tplh	0.00	0.00 – 0.00	0.013
Sex [Male]	-1.90	-2.53 – -1.28	<0.001
GestAge	0.20	0.16 – 0.23	<0.001
ICs	1.90	1.47 – 2.33	<0.001
Random Effects			
σ ²	41.14		
τ ₀₀ site	2.76		
ICC	0.06		
N _{site}	22		
Observations	2114		
Marginal R ² / Conditional R ²	0.134 / 0.188		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Supplementary
Materials 3

Results of Linear Mixed-Effects Models for Cognition
Cognition ~ FA + Sex + GestAge + (1|site)

Fluid			
Predictors	Estimates	CI	p
(Intercept)	48.21	41.06 – 55.36	<0.001
dmdtifp1 389	-0.27	-0.77 – 0.23	0.282
Sex [Male]	-1.33	-2.21 – -0.45	0.003
GestAge	0.37	0.31 – 0.43	<0.001
Random Effects			
σ ²	102.67		
τ ₀₀ site	4.67		
ICC	0.04		
N _{site}	22		
Observations	2100		
Marginal R ² / Conditional R ²	0.071 / 0.112		

Crystalized			
Predictors	Estimates	CI	p
(Intercept)	61.29	56.58 – 66.00	<0.001
dmdtifp1 389	-0.34	-0.67 – -0.00	0.047
Sex [Male]	0.08	-0.50 – 0.66	0.786
GestAge	0.21	0.17 – 0.25	<0.001
Random Effects			
σ ²	44.68		
τ ₀₀ site	2.75		
ICC	0.06		
N _{site}	22		
Observations	2114		
Marginal R ² / Conditional R ²	0.053 / 0.108		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Longitudinal Linear Mixed Effects Models

GM volume ~ group + TimePoint + Sex + GestAge + ICs + (1|site) + (1|subject)

Green line highlights
significant results

	tplh		
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	8294.03	7557.96 – 9030.10	<0.001
groupnew [pre A]	-106.94	-212.38 – -1.50	0.047
groupnew [pre B]	-261.10	-432.50 – -89.70	0.003
TimePoint [2]	131.25	97.96 – 164.55	<0.001
TimePoint [3]	231.17	197.87 – 264.47	<0.001
Sex	-152.80	-252.96 – -52.63	0.003
GestAge	-2.05	-8.07 – 3.96	0.503
ICs	580.04	525.97 – 634.11	<0.001
Random Effects			
σ ²	72464.17		
τ ₀₀ subjectID	223979.59		
τ ₀₀ site	15472.60		
ICC	0.77		
N _{subjectID}	503		
N _{site}	21		
Observations	1509		
Marginal R ² / Conditional R ²	0.551 / 0.896		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Longitudinal Linear Mixed Effects Models

GM volume ~ group + TimePoint + Sex + GestAge + ICs + (1|site) + (1|subject)

crbcortexrh			
Predictors	Estimates	CI	p
(Intercept)	64427.55	58019.97 – 70835.12	<0.001
groupnew [pre A]	-695.13	-1622.41 – 232.16	0.142
groupnew [pre B]	107.62	-1379.36 – 1594.60	0.887
TimePoint [2]	653.18	507.22 – 799.14	<0.001
TimePoint [3]	702.75	556.78 – 848.71	<0.001
Sex	-3535.06	-4403.87 – -2666.25	<0.001
GestAge	-7.87	-60.05 – 44.31	0.767
ICs	3413.40	2940.64 – 3886.17	<0.001
Random Effects			
σ ²	1392590.67		
τ ₀₀ subjectID	18034155.29		
τ ₀₀ site	2027755.36		
ICC	0.94		
N _{subjectID}	503		
N _{site}	21		
Observations	1509		
Marginal R ² / Conditional R ²	0.478 / 0.966		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Longitudinal Linear Mixed Effects Models

GM volume ~ group + TimePoint + Sex + GestAge + ICs + (1|site) + (1|subject)

	rracatelh		
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>
(Intercept)	3911.41	3216.87 – 4605.96	<0.001
groupnew [pre A]	-81.22	-180.08 – 17.65	0.107
groupnew [pre B]	-43.21	-205.24 – 118.82	0.601
TimePoint [2]	-17.12	-35.11 – 0.86	0.062
TimePoint [3]	-79.08	-97.07 – -61.10	<0.001
Sex	37.70	-57.01 – 132.41	0.435
GestAge	-6.20	-11.88 – -0.51	0.033
ICs	370.03	319.16 – 420.90	<0.001
Random Effects			
σ ²	21142.25		
τ ₀₀ subjectID	215925.50		
τ ₀₀ site	10319.79		
ICC	0.91		
N _{subjectID}	503		
N _{site}	21		
Observations	1509		
Marginal R ² / Conditional R ²	0.335 / 0.943		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume

Results of Longitudinal Linear Mixed Effects Models

FA ~ group + TimePoint + Sex + GestAge + (1|site) + (1|subject)

Green line highlights
significant results

ant Cing FA			
Predictors	Estimates	CI	p
(Intercept)	0.31	0.27 – 0.34	<0.001
groupnew [pre A]	0.00	-0.00 – 0.01	0.134
groupnew [pre B]	0.01	0.01 – 0.02	<0.001
TimePoint [2]	-0.00	-0.01 – -0.00	<0.001
TimePoint [3]	-0.00	-0.00 – 0.00	0.288
Sex	0.01	0.00 – 0.01	<0.001
GestAge	0.00	-0.00 – 0.00	0.109
Random Effects			
σ ²	0.00		
τ ₀₀ subjectID	0.00		
τ ₀₀ site	0.00		
ICC	0.72		
N _{site}	22		
N _{subjectID}	2127		
Observations	4133		
Marginal R ² / Conditional R ²	0.012 / 0.719		

Bonferroni correction
p< 0.003

groupnew [pre A] - Moderately Premature
groupnew [pre B] - Very Premature
GestAge - gestational age
ICs - Intercranial Volume