Supporting Table S1: Measures of NAA/Cr calculated in lobar WM and GM, thalamus and putamen using sDec, M-Int, vAvg, and vReg methods. The percent absolute differences calculated using M-Int, vAvg, and vReg methods as compared to sDec methods are also shown. Significant differences from the sDec method are shown with asterisks with FDR corrected p<0.05, p<0.01, and p<0.001 denoted by *, **, and ***, respectively.

WM	**NAA/Cr (Mean ± Std. Dev.)**				**% Absolute Difference from sDec**		
Region	sDec	M-Int	vAvg	vReg	M-Int	vAvg	vReg
RF	1.635 ± 0.146	1.62 ± 0.141	1.67 ± 0.15	1.66 ± 0.149	0.958	2.141	1.518
LF	1.628 ± 0.143	1.618 ± 0.142	1.676 ± 0.154	1.663 ± 0.15	0.592	2.952 (*)	2.182
RT	1.658 ± 0.17	1.647 ± 0.162	1.674 ± 0.162	1.665 ± 0.187	0.662	0.979	0.430
LT	1.662 ± 0.16	1.654 ± 0.164	1.688 ± 0.167	1.682 ± 0.19	0.455	1.570	1.211
RP	1.676 ± 0.153	1.665 ± 0.15	1.707 ± 0.163	1.722 ± 0.17	0.670	1.845	2.762 (*)
LP	1.686 ± 0.151	1.677 ± 0.15	1.708 ± 0.161	1.722 ± 0.169	0.518	1.308	2.135
RO	1.611 ± 0.181	1.602 ± 0.16	1.648 ± 0.154	1.645 ± 0.189	0.552	2.279	2.112
LO	1.628 ± 0.178	1.6 ± 0.158	1.641 ± 0.153	1.678 ± 0.202	1.741	0.773	3.056
C	1.162 ± 0.263	1.198 ± 0.239	1.263 ± 0.251	1.161 ± 0.296	3.136	8.696 (***)	0.100

GM	**NAA/Cr (Mean ± Std. Dev.)**				**% Absolute Difference from sDec**		
Region	sDec	M-Int	vAvg	vReg	M-Int	vAvg	vReg
RF	1.309 ± 0.117	1.41 ± 0.15	1.398 ± 0.143	1.331 ± 0.133	7.668 (***)	6.772 (***)	1.704
LF	1.322 ± 0.123	1.398 ± 0.161	1.435 ± 0.146	1.436 ± 0.152	5.785 (***)	8.598 (***)	8.651 (***)
RT	1.335 ± 0.132	1.326 ± 0.213	1.337 ± 0.201	1.113 ± 0.136	0.686	0.141	16.615 (***)
LT	1.269 ± 0.129	1.304 ± 0.236	1.338 ± 0.217	1.285 ± 0.128	2.717	5.377 (***)	1.234
RP	1.352 ± 0.118	1.513 ± 0.127	1.466 ± 0.127	1.28 ± 0.146	11.905 (***)	8.389 (***)	5.305 (***)
LP	1.325 ± 0.123	1.507 ± 0.137	1.474 ± 0.142	1.351 ± 0.118	13.747 (***)	11.255 (***)	1.915 (*)
RO	1.356 ± 0.152	1.52 ± 0.117	1.513 ± 0.172	1.243 ± 0.177	12.084 (***)	11.599 (***)	8.324 (***)
LO	1.3 ± 0.149	1.469 ± 0.182	1.442 ± 0.154	1.256 ± 0.168	12.952 (***)	10.884 (***)	3.431 (**)
C	0.925 ± 0.178	0.969 ± 0.139	0.918 ± 0.178	0.775 ± 0.13	4.787 (**)	0.708	16.222 (***)

	NAA/Cr (Mean ± Std. Dev.)				**% Absolute Difference from sDec**		
Region	sDec	M-Int	vAvg		M-Int	vAvg	vReg
Thalamus	1.474 ± 0.159	1.488 ± 0.152	1.517 ± 0.165	1.516 ± 0.155	0.960	2.939 (*)	2.862 (**)
Putamen	1.415 ± 0.132	1.43 ± 0.127	1.461 ± 0.134	1.46 ± 0.135	1.066	3.223 (**)	3.141

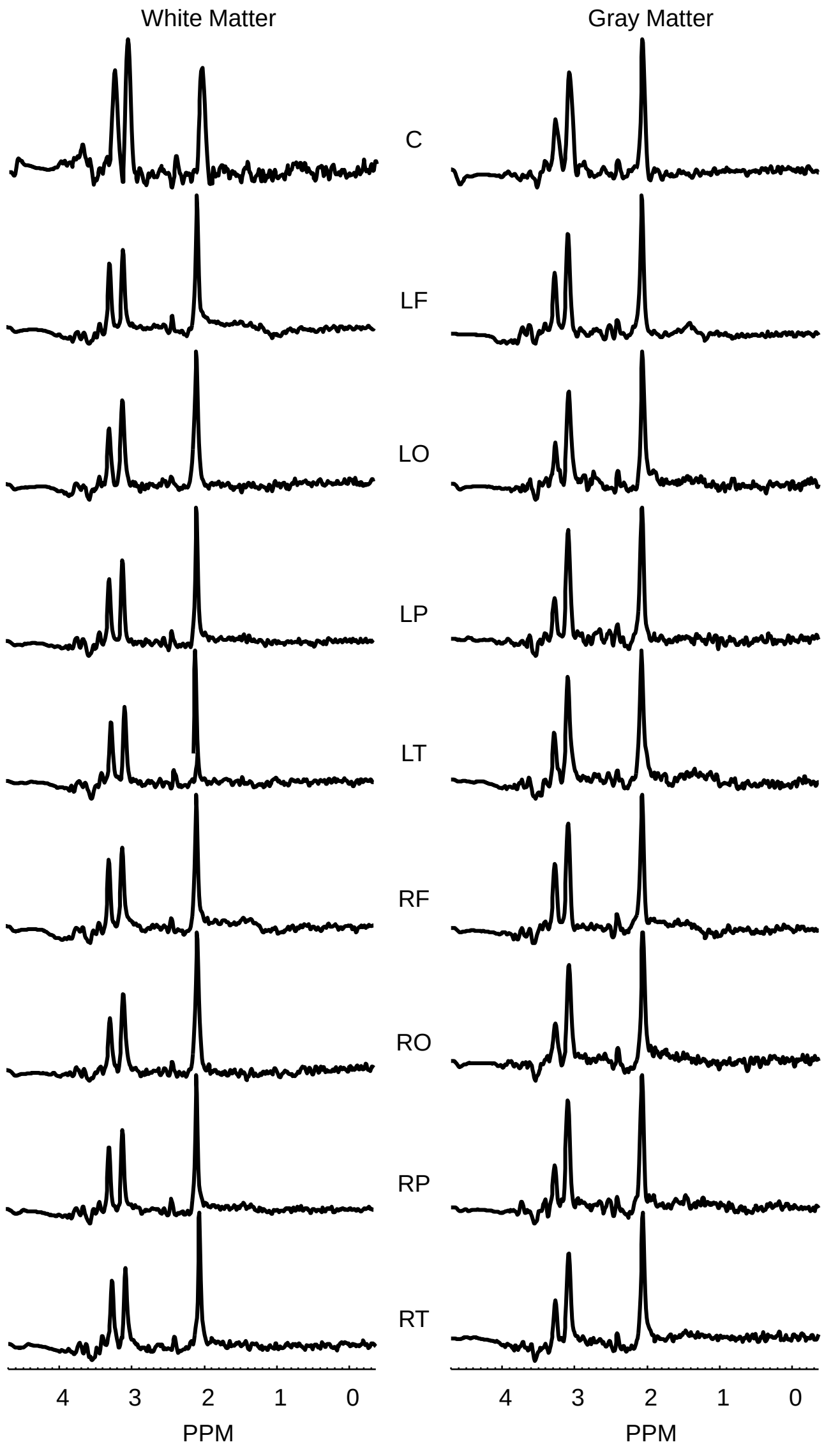
Supporting Table S2. Regression equations for associations of NAA/Cr and Cho/Cr with Age in WM regions.

WM Region	Regression Equation for NAA/Cr	R^2	FDR p-value	Regression Equation for Cho/Cr	R^2	FDR p-value
Cerebellum	NAA/Cr = 1.277 - 0.0031 * Age	0.02	0.040	Cho/Cr = 0.278 + 0 * Age	0.01	0.982
L Frontal Lobe	NAA/Cr = 1.853 - 0.0058 * Age	0.32	< 0.001	Cho/Cr = 0.274 + 0.0008 * Age	0.12	< 0.001
L Occipital Lobe	NAA/Cr = 1.908 - 0.0074 * Age	0.34	< 0.001	Cho/Cr = 0.202 + 0.0004 * Age	0.02	0.037
L Parietal Lobe	NAA/Cr = 1.933 - 0.0066 * Age	0.38	< 0.001	Cho/Cr = 0.265 + 0.0004 * Age	0.04	0.007
L Temporal Lobe	NAA/Cr = 1.889 - 0.0061 * Age	0.29	< 0.001	Cho/Cr = 0.269 + 0.0005 * Age	0.05	0.003
R Frontal Lobe	NAA/Cr = 1.842 - 0.0057 * Age	0.32	< 0.001	Cho/Cr = 0.268 + 0.0008 * Age	0.13	< 0.001
R Occipital Lobe	NAA/Cr = 1.891 - 0.0075 * Age	0.34	< 0.001	Cho/Cr = 0.200 + 0.0004 * Age	0.03	0.018
R Parietal Lobe	NAA/Cr = 1.933 - 0.0068 * Age	0.40	< 0.001	Cho/Cr = 0.266 + 0.0005 * Age	0.05	0.002
R Temporal Lobe	NAA/Cr = 1.901 - 0.0065 * Age	0.29	< 0.001	Cho/Cr = 0.289 + 0.0005 * Age	0.05	0.003
Whole Brain	NAA/Cr = 1.836 - 0.0060 * Age	0.18	< 0.001	Cho/Cr = 0.257 + 0.0005 * Age	0.02	0.042

Supporting Table S3. Regression equations for associations of NAA/Cr and Cho/Cr with Age in GM regions.

GM Region	Regression Equation for NAA/Cr	R^2	FDR p-value	Regression Equation for Cho/Cr	R^2	FDR p-value
Cerebellum	NAA/Cr = 1.068 - 0.0038 * Age	0.08	< 0.001	Cho/Cr = 0.185 - 0.0002 * Age	0.00	0.306
L Frontal Lobe	NAA/Cr = 1.494 - 0.0049 * Age	0.36	< 0.001	Cho/Cr = 0.200 - 0.0001 * Age	0.00	0.605
L Occipital Lobe	NAA/Cr = 1.434 - 0.0036 * Age	0.11	< 0.001	Cho/Cr = 0.142 - 0.0002 * Age	0.01	0.132
L Parietal Lobe	NAA/Cr = 1.493 - 0.0045 * Age	0.27	< 0.001	Cho/Cr = 0.134 + 0.0001 * Age	0.00	0.447
L Temporal Lobe	NAA/Cr = 1.427 - 0.0042 * Age	0.21	< 0.001	Cho/Cr = 0.170 - 0.0003 * Age	0.01	0.097
R Frontal Lobe	NAA/Cr = 1.504 - 0.0049 * Age	0.32	< 0.001	Cho/Cr = 0.193 + 0 * Age	0.01	0.982
R Occipital Lobe	NAA/Cr = 1.480 - 0.0033 * Age	0.09	< 0.001	Cho/Cr = 0.131 - 0.0002 * Age	0.01	0.109
R Parietal Lobe	NAA/Cr = 1.520 - 0.0045 * Age	0.29	< 0.001	Cho/Cr = 0.134 + 0 * Age	0.01	0.911
R Temporal Lobe	NAA/Cr = 1.483 - 0.0040 * Age	0.18	< 0.001	Cho/Cr = 0.167 - 0.0001 * Age	0.00	0.399
Whole Brain	NAA/Cr = 1.433 - 0.0042 * Age	0.10	< 0.001	Cho/Cr = 0.162 - 0.0001 * Age	0.00	0.115

Supporting Figure S1



Supporting Figure S1: The sDec derived WM and GM spectra for an individual from all studied lobar regions. Results are shown for the right and left frontal (RF and LF), temporal (RT and LT), parietal (RP and LP), and occipital (RO and LO) lobes, and the cerebellum (C).