

Supplemental Table 1: Associations between ICOH during neonatal REM sleep, indeterminate sleep, and wakefulness and 18-month language outcomes (Central electrodes)							
Association between LEFT hemisphere ICOH^a (C3-Cz EEG electrodes) during neonatal REM^b sleep and 18-month language outcomes				Association between RIGHT hemisphere ICOH (C4-Cz EEG electrodes) during neonatal REM sleep and 18-month language outcomes			
EEG Frequency	Maternal Voice Playback	C3-Cz ICOH all subjects		EEG Frequency	Maternal Voice Playback	C4-Cz ICOH all subjects	
		rho	p-value			rho	p-value
0.33-2 Hz	off	-0.136	0.436	0.33-2 Hz	off	0.032	0.854
2-4 Hz	off	-0.157	0.368	2-4 Hz	off	-0.216	0.213
4-8 Hz	off	-0.182	0.295	4-8 Hz	off	-0.284	0.098
8-12 Hz	off	-0.371	0.028*	8-12 Hz	off	-0.285	0.097
12-16 Hz	off	-0.233	0.178	12-16 Hz	off	-0.368	0.029*
16-30 Hz	off	-0.141	0.419	16-30 Hz	off	-0.318	0.063
0.33-2 Hz	on	-0.042	0.819	0.33-2 Hz	on	0.075	0.684
2-4 Hz	on	-0.130	0.478	2-4 Hz	on	-0.245	0.177
4-8 Hz	on	-0.177	0.331	4-8 Hz	on	-0.274	0.129
8-12 Hz	on	-0.348	0.051	8-12 Hz	on	-0.254	0.160
12-16 Hz	on	-0.503	0.003*	12-16 Hz	on	-0.238	0.189
16-30 Hz	on	-0.377	0.033*	16-30 Hz	on	-0.195	0.285
Association between LEFT hemisphere ICOH (C3-Cz EEG electrodes) during neonatal indeterminate sleep and 18-month language outcomes				Association between RIGHT hemisphere ICOH (C4-Cz EEG electrodes) during neonatal indeterminate sleep and 18-month language outcomes			
EEG Frequency	Maternal Voice Playback	C3-Cz ICOH all subjects		EEG Frequency	Maternal Voice Playback	C4-Cz ICOH all subjects	
		rho	p-value			rho	p-value
0.33-2 Hz	off	-0.138	0.429	0.33-2 Hz	off	-0.048	0.784
2-4 Hz	off	-0.310	0.070	2-4 Hz	off	-0.086	0.621
4-8 Hz	off	-0.191	0.272	4-8 Hz	off	-0.226	0.192
8-12 Hz	off	-0.357	0.035*	8-12 Hz	off	-0.250	0.147
12-16 Hz	off	-0.277	0.107	12-16 Hz	off	-0.212	0.222
16-30 Hz	off	-0.052	0.768	16-30 Hz	off	-0.240	0.164
0.33-2 Hz	on	-0.477	0.006*	0.33-2 Hz	on	-0.244	0.178
2-4 Hz	on	-0.501	0.003*	2-4 Hz	on	-0.268	0.138
4-8 Hz	on	-0.339	0.058	4-8 Hz	on	-0.303	0.092
8-12 Hz	on	-0.475	0.006*	8-12 Hz	on	-0.302	0.093
12-16 Hz	on	-0.299	0.096	12-16 Hz	on	-0.313	0.082
16-30 Hz	on	-0.312	0.082	16-30 Hz	on	-0.181	0.322
Association between LEFT hemisphere ICOH (C3-Cz EEG electrodes) during neonatal wakefulness and 18-month language outcomes				Association between RIGHT hemisphere ICOH (C4-Cz EEG electrodes) during neonatal wakefulness and 18-month language outcomes			
EEG Frequency	Maternal Voice Playback	C3-Cz ICOH all subjects		EEG Frequency	Maternal Voice Playback	C4-Cz ICOH all subjects	
		rho	p-value			rho	p-value
0.33-2 Hz	off	0.069	0.692	0.33-2 Hz	off	0.192	0.268
2-4 Hz	off	-0.137	0.434	2-4 Hz	off	0.172	0.323
4-8 Hz	off	-0.068	0.696	4-8 Hz	off	-0.114	0.516
8-12 Hz	off	-0.246	0.154	8-12 Hz	off	-0.125	0.475
12-16 Hz	off	-0.362	0.033*	12-16 Hz	off	-0.257	0.136
16-30 Hz	off	-0.095	0.586	16-30 Hz	off	-0.016	0.927
0.33-2 Hz	on	-0.193	0.291	0.33-2 Hz	on	0.019	0.917
2-4 Hz	on	-0.254	0.160	2-4 Hz	on	0.027	0.883
4-8 Hz	on	-0.214	0.240	4-8 Hz	on	-0.294	0.103
8-12 Hz	on	-0.349	0.050*	8-12 Hz	on	-0.25	0.168

12-16 Hz	on	-0.321	0.073	12-16 Hz	on	-0.244	0.178
16-30 Hz	on	-0.167	0.361	16-30 Hz	on	-0.049	0.791

^aREM = rapid eye movement

^bICOH = imaginary part of the coherence (presented as average ICOH across each frequency range)

*denotes $p < 0.05$

Supplemental Table: Associations between ICOH during neonatal REM sleep, indeterminate sleep, and wakefulness and 18-month language outcomes (temporal electrodes)							
Association between LEFT hemisphere ICOH ^a (T3-Cz EEG electrodes) during neonatal REM ^b sleep and 18-month language outcomes				Association between RIGHT hemisphere ICOH (T4-Cz EEG electrodes) during neonatal REM sleep and 18-month language outcomes			
EEG Frequency	Maternal Voice Playback	T3-Cz ICOH all subjects		EEG Frequency	Maternal Voice Playback	T4-Cz ICOH all subjects	
		rho	p-value			rho	p-value
0.33-2 Hz	off	0.093	0.594	0.33-2 Hz	off	0.042	0.810
2-4 Hz	off	-0.114	0.515	2-4 Hz	off	-0.091	0.603
4-8 Hz	off	-0.23	0.184	4-8 Hz	off	-0.188	0.279
8-12 Hz	off	-0.241	0.163	8-12 Hz	off	-0.120	0.493
12-16 Hz	off	-0.148	0.395	12-16 Hz	off	-0.267	0.121
16-30 Hz	off	-0.380	0.024*	16-30 Hz	off	-0.261	0.130
0.33-2 Hz	on	0.124	0.498	0.33-2 Hz	on	0.057	0.755
2-4 Hz	on	-0.207	0.255	2-4 Hz	on	-0.240	0.186
4-8 Hz	on	-0.265	0.143	4-8 Hz	on	-0.231	0.204
8-12 Hz	on	-0.355	0.046*	8-12 Hz	on	-0.173	0.344
12-16 Hz	on	-0.495	0.004*	12-16 Hz	on	-0.093	0.611
16-30 Hz	on	-0.565	0.001*	16-30 Hz	on	-0.098	0.593
Association between LEFT hemisphere ICOH (TC3-Cz EEG electrodes) during neonatal indeterminate sleep and 18-month language outcomes				Association between RIGHT hemisphere ICOH (T4-Cz EEG electrodes) during neonatal indeterminate sleep and 18-month language outcomes			
EEG Frequency	Maternal Voice Playback	T3-Cz ICOH all subjects		EEG Frequency	Maternal Voice Playback	T4-Cz ICOH all subjects	
		rho	p-value			rho	p-value
0.33-2 Hz	off	0.100	0.57	0.33-2 Hz	off	-0.089	0.611
2-4 Hz	off	-0.078	0.658	2-4 Hz	off	-0.134	0.443
4-8 Hz	off	-0.259	0.133	4-8 Hz	off	-0.217	0.211
8-12 Hz	off	-0.337	0.048*	8-12 Hz	off	-0.288	0.094
12-16 Hz	off	-0.404	0.016*	12-16 Hz	off	-0.353	0.037*
16-30 Hz	off	-0.504	0.002*	16-30 Hz	off	-0.309	0.071
0.33-2 Hz	on	-0.133	0.468	0.33-2 Hz	on	-0.109	0.551
2-4 Hz	on	-0.44	0.012*	2-4 Hz	on	-0.367	0.039*
4-8 Hz	on	-0.379	0.033*	4-8 Hz	on	-0.213	0.242
8-12 Hz	on	-0.381	0.031*	8-12 Hz	on	-0.210	0.248
12-16 Hz	on	-0.570	0.001*	12-16 Hz	on	-0.498	0.004*
16-30 Hz	on	-0.637	0.0001*	16-30 Hz	on	-0.164	0.368
Association between LEFT hemisphere ICOH (T3-Cz EEG electrodes) during neonatal wakefulness and 18-month language outcomes				Association between RIGHT hemisphere ICOH (T4-Cz EEG electrodes) during neonatal wakefulness and 18-month language outcomes			
EEG Frequency	Maternal Voice Playback	T3-Cz ICOH all subjects		EEG Frequency	Maternal Voice Playback	T4-Cz ICOH all subjects	
		rho	p-value			rho	p-value
0.33-2 Hz	off	-0.074	0.675	0.33-2 Hz	off	0.206	0.235
2-4 Hz	off	-0.063	0.720	2-4 Hz	off	0.198	0.254
4-8 Hz	off	-0.142	0.415	4-8 Hz	off	-0.209	0.227
8-12 Hz	off	-0.080	0.649	8-12 Hz	off	-0.129	0.459
12-16 Hz	off	-0.339	0.046*	12-16 Hz	off	-0.444	0.008*
16-30 Hz	off	-0.484	0.003*	16-30 Hz	off	-0.188	0.279
0.33-2 Hz	on	-0.008	0.967	0.33-2 Hz	on	0.159	0.386
2-4 Hz	on	-0.123	0.501	2-4 Hz	on	0.020	0.914
4-8 Hz	on	-0.312	0.083	4-8 Hz	on	-0.099	0.589
8-12 Hz	on	-0.178	0.330	8-12 Hz	on	-0.165	0.366
12-16 Hz	on	-0.464	0.007*	12-16 Hz	on	-0.356	0.046*

16-30 Hz	on	-0.439	0.012*	16-30 Hz	on	-0.304	0.091
----------	----	---------------	---------------	----------	----	--------	-------

^aREM = rapid eye movement

^bICOH = imaginary part of the coherence (presented as average ICOH across each frequency range)

*denotes $p < 0.05$