

**TABLE A1.** Results of statistical models assessing the associations between individual eCAP metrics and CNC word scores measured in three listening conditions.

Listening condition	eCAP metric	Regression coefficient	T value	P value	FDR P value	R <sup>2</sup>
Quiet	ENI index	0.68	1.38	0.182	0.546	0.08
	NA ratio	4.67	0.16	0.872	0.883	0.00
	NA speed	0.23	0.99	0.331	0.664	0.04
	AR ratio	-9.83	-0.31	0.760	0.883	0.00
	AR speed	-0.33	-1.75	0.095	0.450	0.12
	AM ratio	-19.57	-0.70	0.490	0.735	0.02
+10 dB SNR	ENI index	0.73	1.72	0.100	0.450	0.12
	NA ratio	-3.79	-0.15	0.883	0.735	0.00
	NA speed	0.21	0.99	0.332	0.450	0.04
	AR ratio	4.93	0.18	0.863	0.883	0.00
	AR speed	-0.27	-1.58	0.127	0.664	0.10
	AM ratio	-19.57	-0.70	0.490	0.883	0.02
+5 dB SNR	ENI index	1.06	2.12	0.046	0.457	0.17
	NA ratio	5.07	0.16	0.871	0.735	0.00
	NA speed	0.27	1.08	0.290	0.414	0.05
	AR ratio	16.04	0.47	0.642	0.883	0.01
	AR speed	-0.56	-3.06	0.006	0.108	0.30
	AM ratio	-26.14	-0.88	0.388	0.695	0.03

eCAP, electrically evoked compound action potential; CNC, Consonant-Nucleus-Consonant; SNR, signal-to-noise ratio; ENI, electrode neuron interface; NA, neural adaptation; AR, adaptation recovery; AM, amplitude modulation; FDR, false discovery rate

**TABLE A2.** Results of statistical models assessing the associations between individual eCAP metrics and AzBio sentence scores measured in three listening conditions.

Listening condition	eCAP metric	Regression coefficient	T value	P value	FDR P value	R <sup>2</sup>
Quiet	ENI index	0.66	1.56	0.133	0.479	0.10
	NA ratio	32.77	1.37	0.183	0.549	0.08
	NA speed	0.20	0.99	0.332	0.664	0.04
	AR ratio	6.22	0.23	0.823	0.871	0.00
	AR speed	-0.33	-2.08	0.049	0.294	0.16
	AM ratio	13.83	0.57	0.572	0.735	0.01
+10 dB SNR	ENI index	1.96	2.98	0.007	0.063	0.29
	NA ratio	35.76	0.83	0.413	0.709	0.03
	NA speed	0.37	1.05	0.306	0.664	0.05
	AR ratio	-33.63	-0.71	0.488	0.709	0.02
	AR speed	-0.20	-0.67	0.512	0.709	0.02
	AM ratio	-10.49	-0.25	0.807	0.871	0.00
+5 dB SNR	ENI index	1.44	3.11	0.005	0.063	0.31
	NA ratio	24.52	0.80	0.433	0.709	0.03
	NA speed	0.28	1.09	0.287	0.664	0.05
	AR ratio	4.67	0.14	0.894	0.894	0.00
	AR speed	-0.35	-1.70	0.103	0.464	0.12
	AM ratio	-9.04	-0.30	0.769	0.871	0.00

eCAP, electrically evoked compound action potential; SNR, signal-to-noise ratio; ENI, electrode neuron interface; NA, neural adaptation; AR, adaptation recovery; AM, amplitude modulation; FDR, false discovery rate