Recording site	Error	Gain	Loss	Gain$_{facilitated}$	Gain$_{suppressed}$	Loss$_{facilitated}$	Loss$_{suppressed}$	Total
np1	12	27	39	16	17	25	20	140
np2	7	13	43	10	3	35	24	142
P1	39	20	24	17	4	18	15	104
P2	3	25	66	21	10	47	52	133
P3	0	6	17	5	2	12	9	56
Chi-square $\chi^2(4, N = 575)$	101.18 $p < 10^{-5}$	8.89 $p = 0.064$	40.24 $p = 9.5 \times 10^{-5}$	7.518 $p = 0.1109$	14.5 $p = 5.8 \times 10^{-3}$	15.13 $p = 4.4 \times 10^{-3}$	35.19 $p < 10^{-5}$	

Depth (channel units)	Error	Gain	Loss	Gain$_{facilitated}$	Gain$_{suppressed}$	Loss$_{facilitated}$	Loss$_{suppressed}$	Total
1 - 4	1	1	20	1	0	17	17	34
5 - 8	21	19	48	15	6	31	40	114
9 - 12	14	18	20	16	7	14	11	88
13 - 16	6	9	12	7	2	9	4	39
17 - 19	0	4	7	4	1	6	4	18
Chi-square $\chi^2(4, N = 293)$	8.37 $p = 0.079$	6.72 $p = 0.151$	16.65 $p = 0.0023$	5.97 $p = 0.202$	3.04 $p = 0.551$	15.48 $p = 0.0038$	28.61 $p < 10^{-5}$	

Supplementary Table 1

Distribution of Error, Gain and Loss signals across recording sites and cortical depths

Top, Count of Error, Gain, and Loss signals across the 575 recorded neurons sampled from five sites in monkey Eu and monkey X. Facilitated and suppressed instances of Gain and Loss signals were distinguished. Three of the five sites were sampled with perpendicular penetrations (monkey Eu: P1, monkey X: P2 and P3) and two were not (monkey Eu: np1, monkey X: np2). The bottom row shows the test statistics for homogeneity based on a chi-square test. For each signal a 5x2 contingency matrix was constructed based on the counts of units recorded at each site (5 rows) with or without a given response type. Error-related activity was sampled most commonly in one of the three perpendicular penetrations (site P1). Gain-related activity was encountered with equal incidence at different sites. Loss-related activity was sampled most commonly at site P2 of monkey X.

Bottom, Count of the neural signals from sites P1, P2 and P3 across cortical depth, divided into 5 intervals in channel units (with 150 μm spacing between neighboring channels) ranging from depth 1 (surface) to depth 19 (deepest). Depths 2-16 span the estimated cortical gray matter. Loss neurons were distributed significantly differently from the overall neuron sampling distribution. The bottom row shows the test statistics for homogeneity based on a chi-square test. Neurons signaling Loss were not uniformly distributed across cortical depth. Overall, Gain and Loss neurons also showed significantly different depth distributions ($\chi^2(4, N = 201) = 12.86$, p =0.012).

Layer	Method for ERP voltage sampling	Correct and Error		Correct only		Error only	
	Baseline-corrected voltage at peak ERN	$r_s (116) = -0.65$	$p < 10^{-5}$	$r_s (117) = -0.36$	$p = 5.8 \times 10^{-5}$	$r_s (117) = -0.406$	$p < 10^{-5}$
L2/3	Raw voltage at peak ERN	$r_s (116) = -0.44$	$p < 10^{-5}$	$r_s (117) = -0.20$	$p = 0.028$	$r_s (117) = -0.36$	$p = 5.5 \times 10^{-5}$
	Voltage sum during the ERN	$r_s (116) = -0.43$	$p < 10^{-5}$	$r_s (117) = -0.27$	$p = 0.0035$	$r_s (117) = -0.35$	$p < 10^{-5}$
	Baseline-corrected voltage at peak ERN	$r_s (116) = -0.0042$	$p = 0.92$	$r_s (117) = -0.011$	$p = 0.91$	$r_s (117) = -0.207$	$p = 0.024$
L5/6	Raw voltage at peak ERN	$r_s (116) = -0.03$	$p = 0.71$	$r_s (117) = -0.14$	$p = 0.13$	$r_s (117) = -0.18$	$p = 0.055$
	Voltage sum during the ERN	$r_s (116) = -0.09$	$p = 0.32$	$r_s (117) = -0.16$	$p = 0.08$	$r_s (117) = -0.20$	$p = 0.033$

Supplementary Table 2

Statistical tests for ERN-spike relationship

Statistics for the relationship between EEG polarization and spike rate based on different methods of sampling the event-related voltage for Correct and Error trials combined, for Correct trials only, and for Error trials only using partial rank correlations. Note the similarity in outcomes across different methods of ERP sampling. A statistically significant relationship was observed between ERP voltage and simultaneous spike rates in L2/3 for each measurement method across all trial type combinations. Weak and variable outcomes were observed between ERP voltage and simultaneous spike rates in L5/6 across measurement methods.