

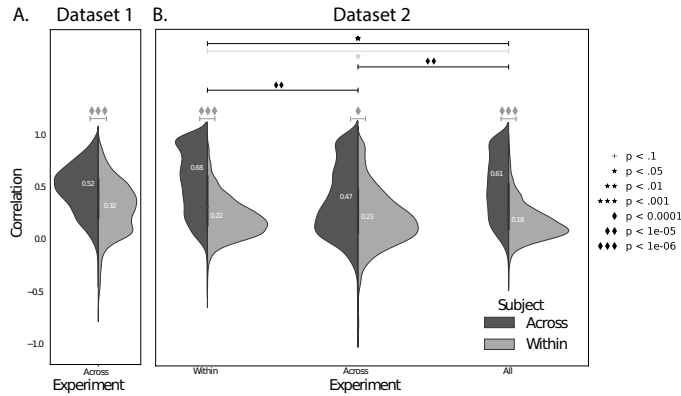
# Supplemental figures for: A Gaussian process model of human electrocorticographic data

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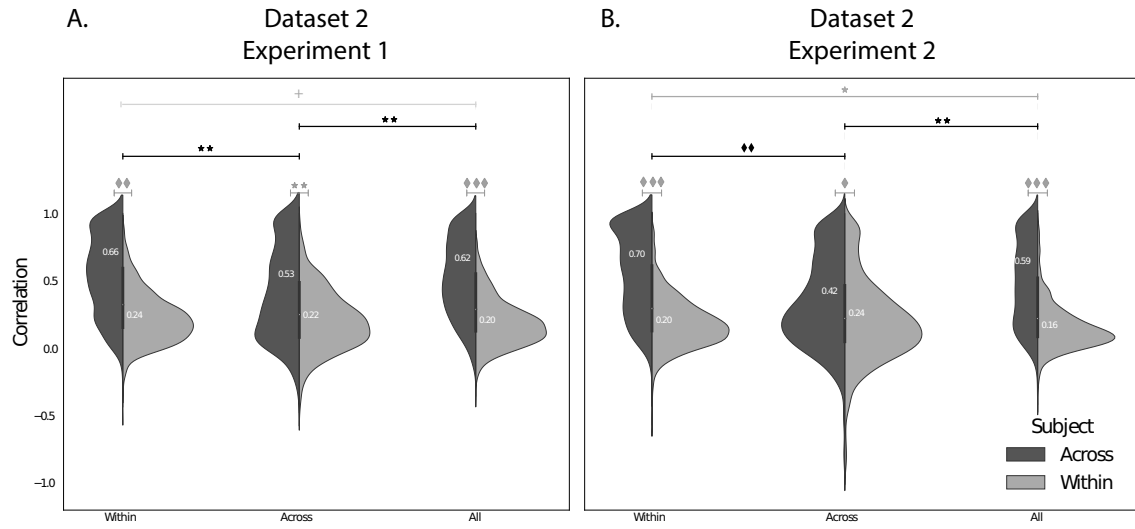
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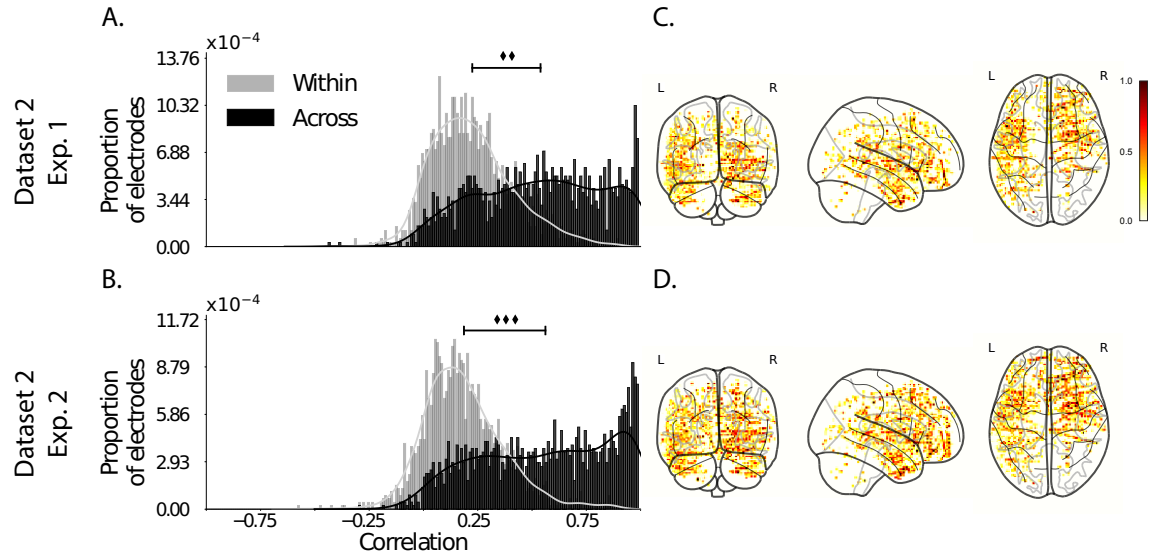
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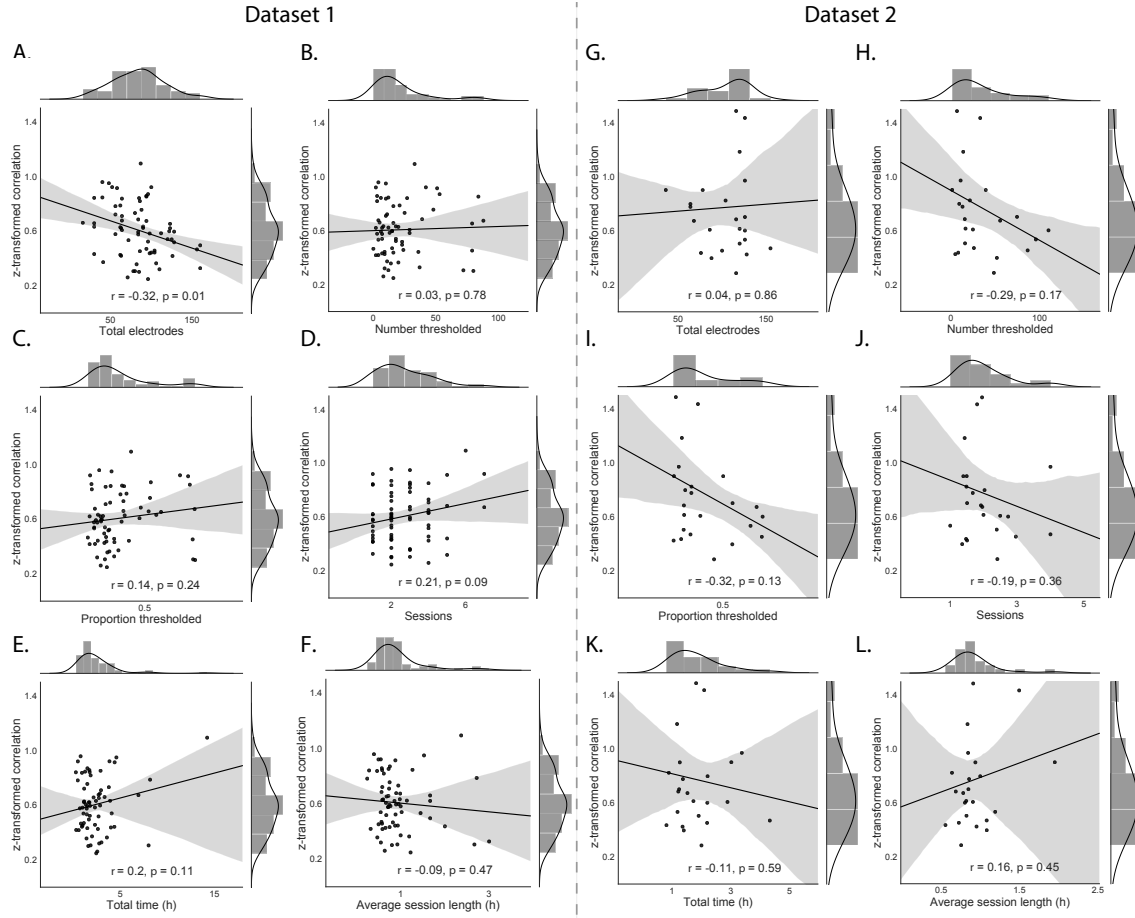
**Figure S1: Reconstruction quality for Datasets 1 and 2. A. Distributions of correlations between observed versus reconstructed activity by electrode, for Dataset 1.** The split violin plot reflects the same data as Figure 3A, presented here for comparison. **B. Distributions of correlation between observed versus reconstructed activity by electrode, for Dataset 2.** The left-most split violin plot (“Within”) reflects the same data as Figure 3B, presented here for comparison. The “Across” plot reflects the same analyses, but limited to models that were trained and tested on *different* Dataset 2 experiments. The “All” plot reflects the same analyses, but including models that were trained and tested on both of the Dataset 2 experiments. All plots: the dark gray distributions denote across-subject correlations (model trained on all but one patient and tested on the held-out patient), and the medium gray distributions denote within-subject correlations (model trained on all but one electrode from one patient, and tested on the held-out electrode). The horizontal bars denote *t*-tests between the corresponding distributions (after z-transforming the correlations), and the white numbers reflect the distribution means. The symbols denote the corresponding *p*-values of those statistical tests.



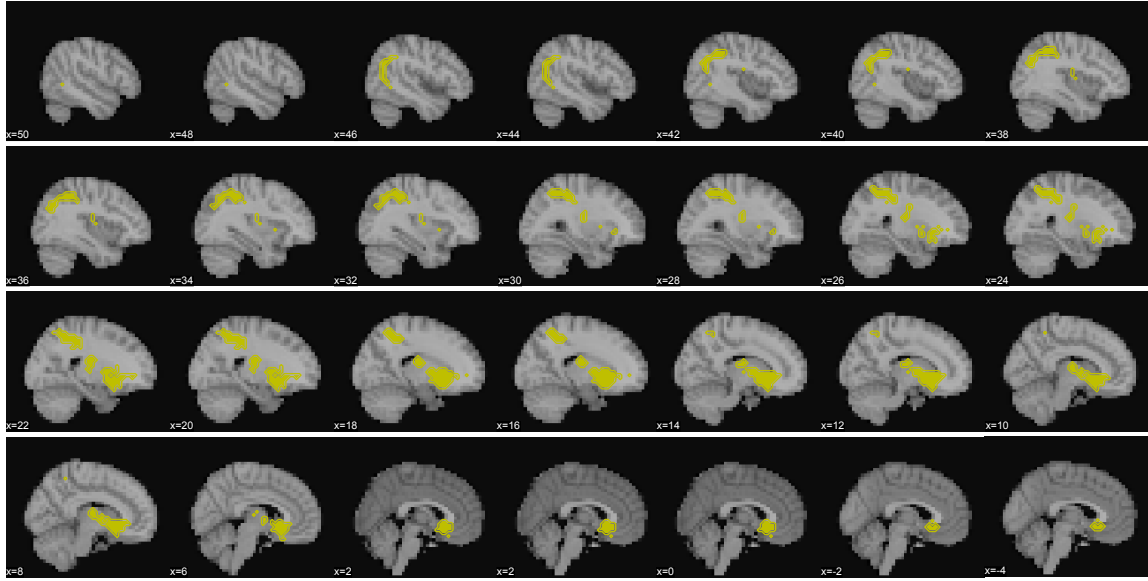
**Figure S2: Reconstruction quality for Dataset 2, Experiments 1 and 2. A. Distributions of correlations between observed versus reconstructed activity by electrode, for Experiment 1.** Each split violin plot and horizontal bar is in the same format as the plots in Figure S1. “Within” denotes within-subject correlations (model trained on all but one electrode from one patient, and tested on the held-out electrode); “Across” denotes across-subject correlations (model trained on all but one patient and tested on the held-out patient); “All” denotes a model trained on all data from all patients, except for one held-out electrode (and tested on the held-out electrode). **B. Distributions of correlations between observed versus reconstructed activity by electrode, for Experiment 2.** All of the plots and bars are in the same format as those in Panel A.



**Figure S3: Reconstruction quality across all electrodes in two Dataset 2 experiments. A. Distributions of correlations between observed versus reconstructed activity by electrode, for Experiment 1.** Same format as Figure 3A and B, but reflects data shown in Figure S2A (leftmost violin plot). **B. Distributions of correlations between observed versus reconstructed activity by electrode, for Experiment 2.** Same format as Figure 3A and B, but reflects data shown in Figure S2B (leftmost violin plot). **C.–D. Reconstruction performance by location.** Each dot reflects the location of a single implanted electrode from Dataset 2, Experiment 1 (Panel C) or Dataset 2, Experiment 2 (Panel D). The dot colors denote the average within-experiment (across-session) correlation, using the across-patient correlation model, between the observed and reconstructed activity at the given electrode location.



**Figure S4: Reconstruction accuracy versus within-subject data features for two ECoG datasets. A.–F. Features from Dataset 1.** Features include: (A.) total number of electrodes implanted in each patient’s brain, (B.) per-patient number of electrodes that were filtered out due to having an maximum kurtosis greater than 10 across all recording sessions, (C.) per-patient proportion of electrodes that were filtered out due to having an average kurtosis greater than 10, (D.) per-patient number of recording sessions, (E.) per-patient total recording time (h), and (F.) per-patient average session length (h). **G.–L. Features from Dataset 2.** Analogous format to Panels A–F.



**Figure S5: Most informative electrode locations.** This map shows the region outlined in white from Figure 5 in greater detail. Across Datasets 1 and 2, electrodes in these locations were identified as yielding the (10%) best reconstruction accuracies at *other* locations throughout the brain. The  $x$ -coordinates in each panel denote the positions of the sagittal slices in MNI space.