

Neuron, Volume 95

Supplemental Information

Partially Mixed Selectivity

in Human Posterior Parietal Association Cortex

Carey Y. Zhang, Tyson Aflalo, Boris Revechkis, Emily R. Rosario, Debra Ouellette, Nader Pouratian, and Richard A. Andersen

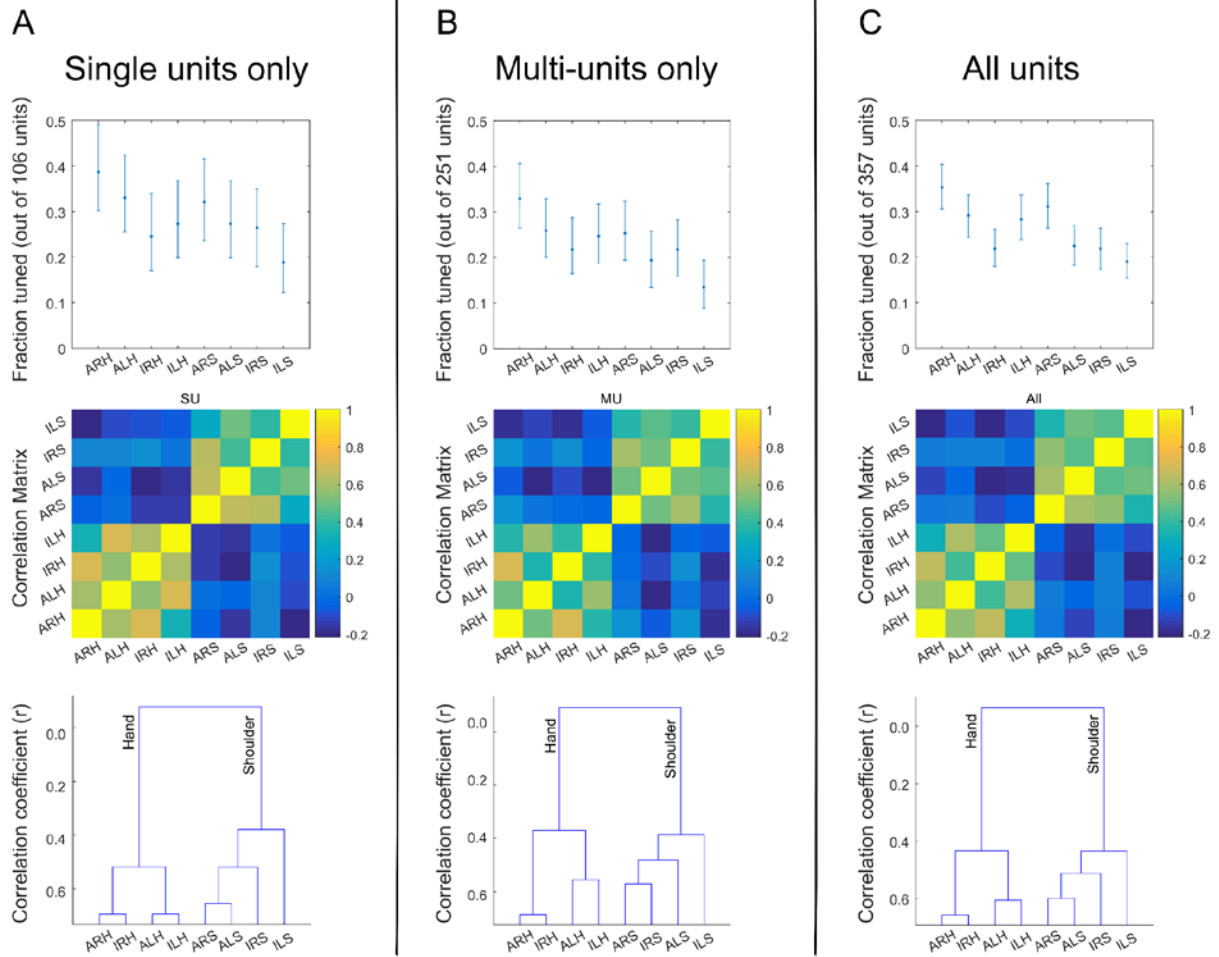


Figure S1 (related to STAR Methods). Using only high-quality single units or multi-units does not qualitatively change results.

(A) *Top*: Fraction of units significantly tuned to each movement condition when considering only high-quality single units ($p < 0.05$, uncorrected 95% confidence intervals). *Middle*: Pairwise correlation matrix between conditions for high-quality single units. Color scale normalized to span the 5th to 95th percentiles of the correlation values. *Bottom*: Dendrogram showing hierarchical organization of responses to the different conditions (using correlation as a distance measure), considering only high-quality single units. (B) Similar to (A) but considering more poorly isolated units. (C) Similar to (A) but considering all units (both single units and multi-units). (ALH = Attempt Left Hand, ILH = Imagine Left Hand, ARH = Attempt Right Hand, IRH = Imagine Right Hand, ALS = Attempt Left Shoulder, ILS = Imagine Left Shoulder, ARS = Attempt Right Shoulder, IRS = Imagine Right Shoulder).

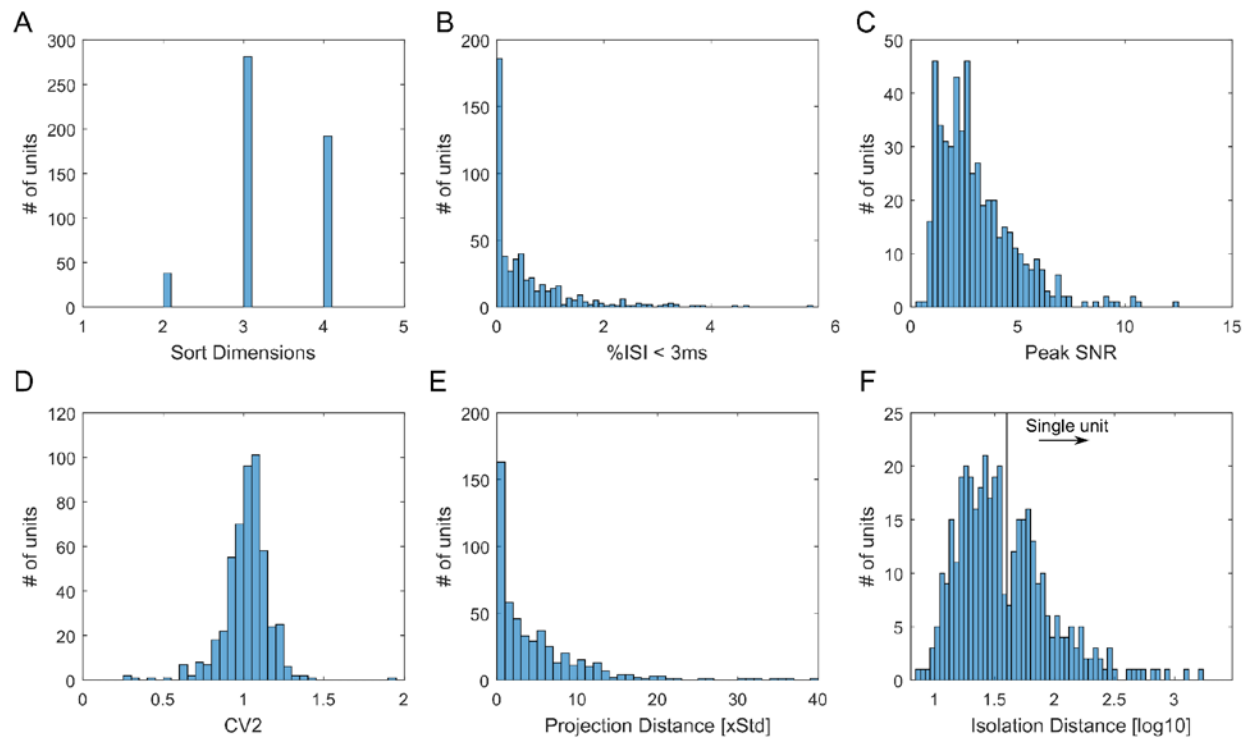


Figure S2 (related to STAR Methods). Metrics of single unit cluster isolation quality.

(A) Distribution of the number of principal components used in the clustering algorithm to isolate each unit (i.e. the number of principal components making up 95% of the variance for each unit). (B) Distribution of the percentage of ISIs less than 3ms for each unit. (C) Distribution of the peak signal-to-noise ratio for each unit. (D) Distribution of the modified coefficient of variation of the ISI for each unit. (E) Distribution of the average between-spike projection distance for each unit. (F) Distribution of the base-10 log of the cluster isolation distances for each unit. The isolation distance threshold used to identify high-quality single units (see Unit quality classification in STAR Methods) is indicated by the vertical line.

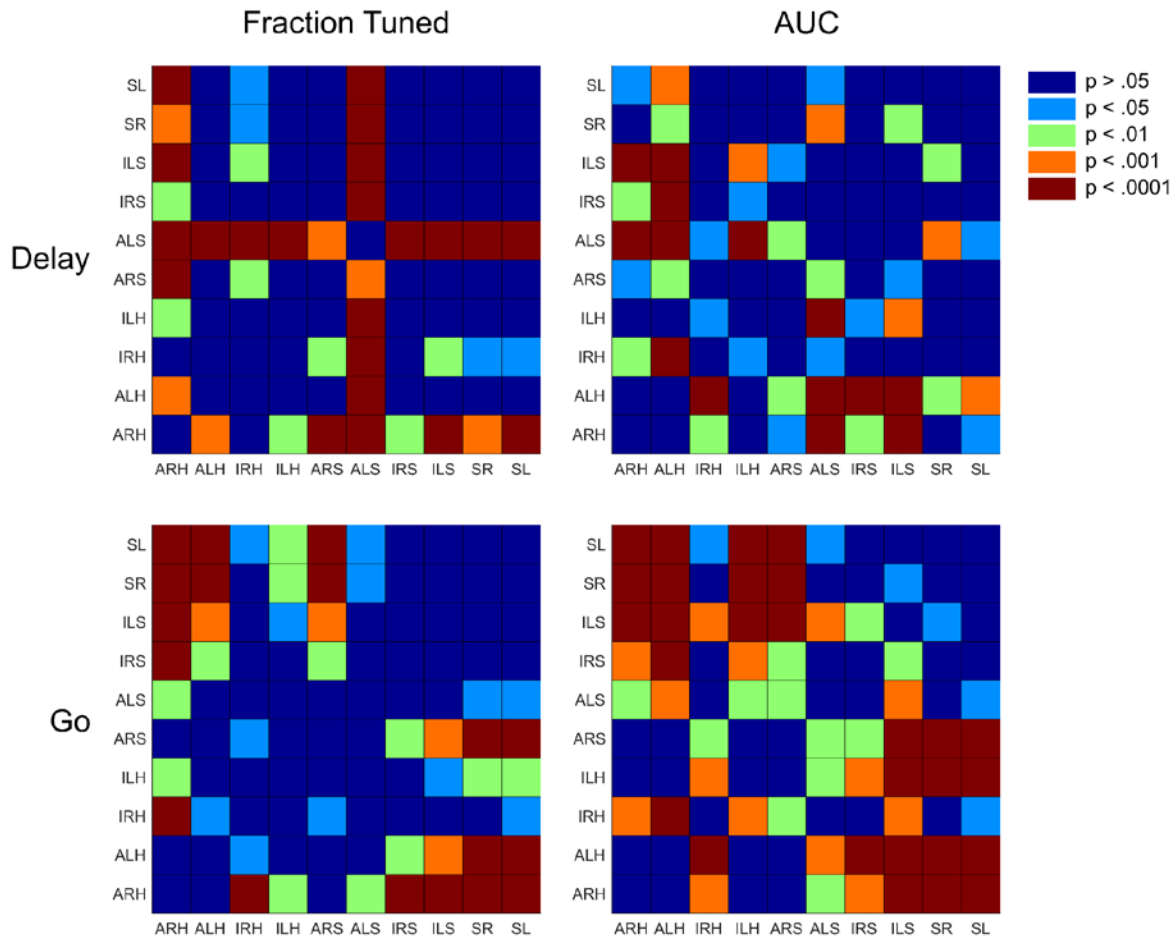


Figure S3 (related to Figure 2). P-values from two-sided Wilcoxon rank sum tests of whether the fraction of the population tuned to each condition or the AUC values for each condition are significantly different.

Figure: P-values from Wilcoxon rank sum tests of whether the conditions' fraction tuned and AUC are significantly different. *Left side:* Tests done using fraction tuned to each condition. *Right side:* Tests done using AUC values for each condition. *Top row:* Tests done using data from the Delay phase. *Bottom row:* Tests done using data from the Go phase. Significance values are color coded with red being significant with $p < 0.0001$ and dark blue being insignificant ($p > 0.05$). (ALH = Attempt Left Hand, ILH = Imagine Left Hand, ARH = Attempt Right Hand, IRH = Imagine Right Hand, ALS = Attempt Left Shoulder, ILS = Imagine Left Shoulder, ARS = Attempt Right Shoulder, IRS = Imagine Right Shoulder, SR = Speak Right, SL = Speak Left).

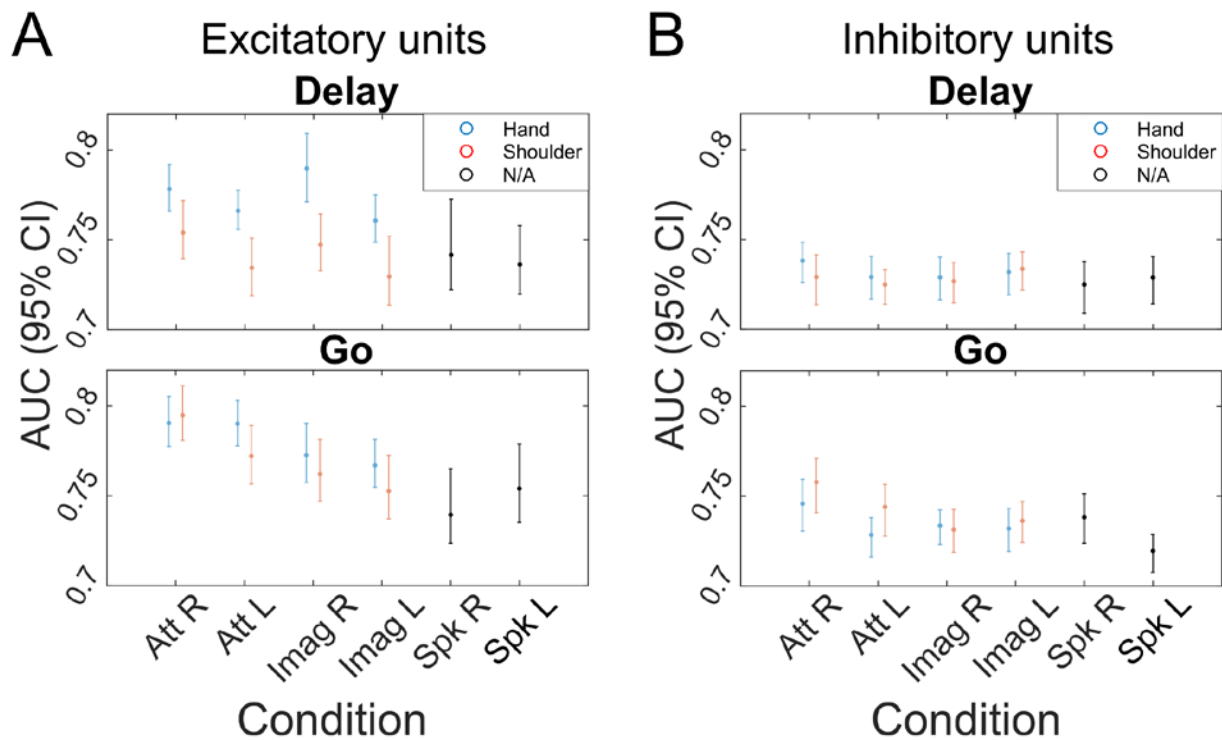


Figure S4 (related to Figure 2). AUC of units for each condition is comparable between excitatory (positively tuned) and inhibitory (negatively tuned) units.

(A) AUC values for excitatory units, split by movement condition (strategy, body side, and body part). Error bars represent the 95% bootstrapped confidence intervals of the AUC values. *Top*: AUC for units during the Delay phase. *Bottom*: AUC for units during the Go phase. (B) Similar to (A) but for only inhibitory units. Condition labels were flipped for presentation of AUC values for the inhibitory units for ease of comparison (see STAR Methods). (Att R = Attempt Right, Att L = Attempt Left, Imag R = Imagine Right, Imag L = Imagine Left, Spk R = Speak Right, Spk L = Speak Left).

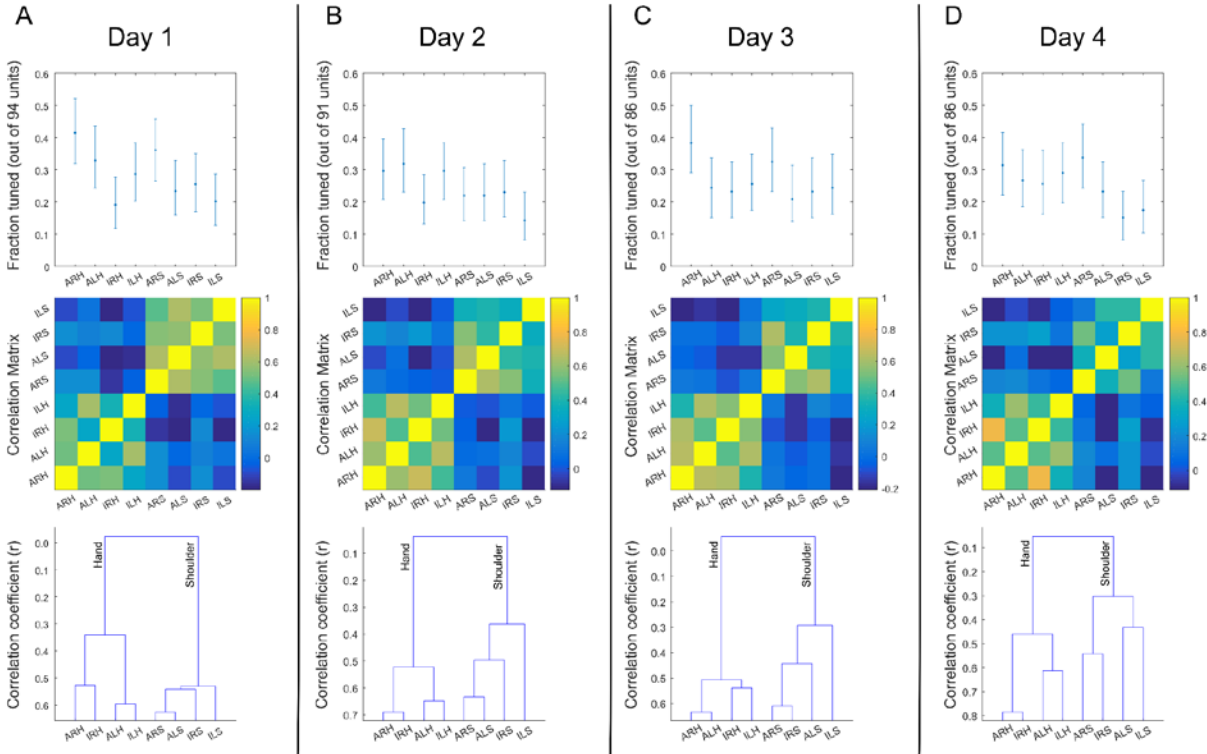


Figure S5 (related to Figures 2A, 5). Results are consistent across separate days of recording sessions.

(A) *Top:* Fraction of units significantly tuned to each movement condition for Day 1 ($p < 0.05$, uncorrected 95% confidence intervals). *Middle:* Pairwise correlation matrix between movement conditions for Day 1. Color scale normalized to span the 5th to 95th percentiles of the correlation values. *Bottom:* Dendrogram showing hierarchical organization of responses to the different conditions for Day 1. (B-D) Similar to (A) but for Days 2-4, respectively. (ALH = Attempt Left Hand, ILH = Imagine Left Hand, ARH = Attempt Right Hand, IRH = Imagine Right Hand, ALS = Attempt Left Shoulder, ILS = Imagine Left Shoulder, ARS = Attempt Right Shoulder, IRS = Imagine Right Shoulder).