# Supporting Information

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### Results

**Sequential Position of Events Within a Trial.** In this analysis we asked whether correlations are greater for task events closer together in time. For cues, we compared correlations with the immediately following delay versus the fourth delay in those trials with three nontargets preceding the target. Similarly for targets, we compared correlations with fourth delays versus first delays.

The analysis was conducted six times, once for each combination of trial type and hemifield. We included data from all 324 cells, using the same mean normalization as in our main analysis (Fig. 3). The results showed no tendency toward higher correlation for events close in time. For cues and the delays that immediately followed them (e.g., cue 1, ipsilateral hemifield and delays immediately following this cue; temporally adjacent), the median correlation across all six analyses was $-0.01$. For cues and fourth delays after these cues (temporally separate), the median correlation was almost identical at $-0.04$ (comparison of these two values $P > 0.3$, Williams' test). For targets and the first delay on trials leading up to these targets (temporally separate), the median correlation was 0.09. For targets and fourth delays (temporally adjacent), the median correlation was even lower at $-0.04$. The results show that correlations between different task events do not simply decrease with temporal separation.

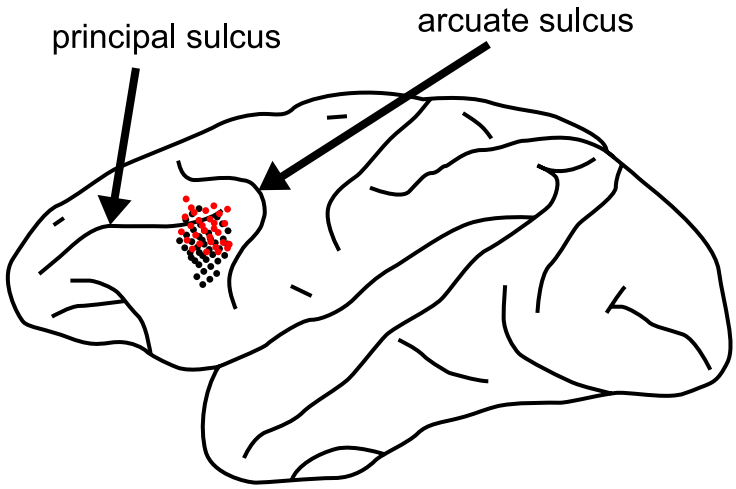


**Fig. S1.** Reconstructed recording locations for monkey A (red dots, recorded in right hemisphere but here transposed to left) and B (black dots, left hemisphere).

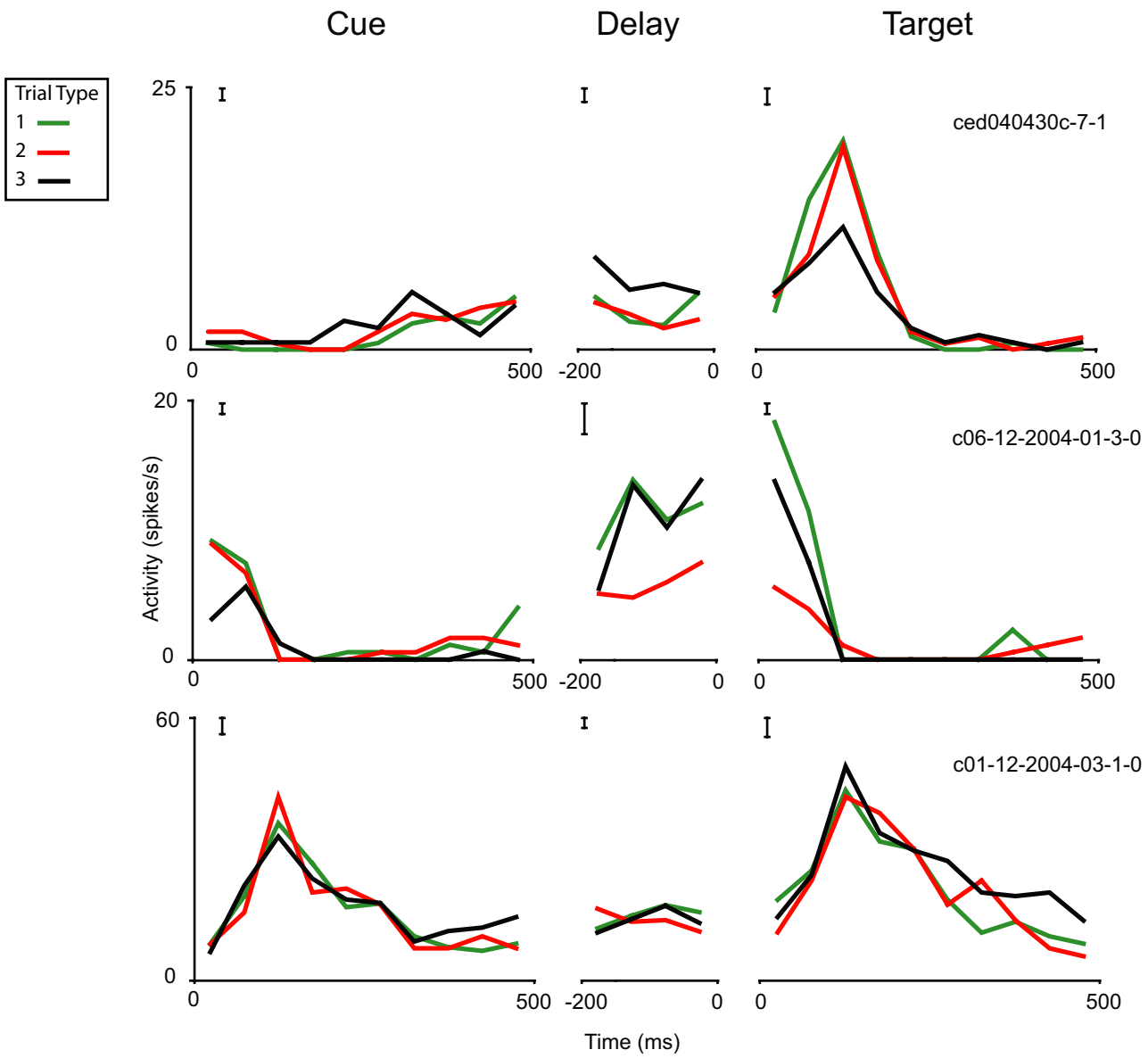


**Fig. S2.** Activity patterns of example cells. For each cell, the figure shows mean activity during cues, delays, and targets in one hemifield (in each case, contralateral to recording location). For cues and targets, time 0 corresponds to stimulus onset; for delays, time 0 corresponds to onset of the following stimulus. Bar at upper left or each panel shows average standard error of the mean. The first cell (*Upper*) shows a weak increase of activity during cue presentation, sustained activity (significantly greater for trial type 3, $P < 0.05$) during delays, and a strong response at target onset. The second cell (*Middle*) shows strong inhibition at cue or target onset, but sustained activity (significantly weaker for trial type 2, $P < 0.05$) during delays. The third cell (*Lower*) shows similar response to cues and targets.

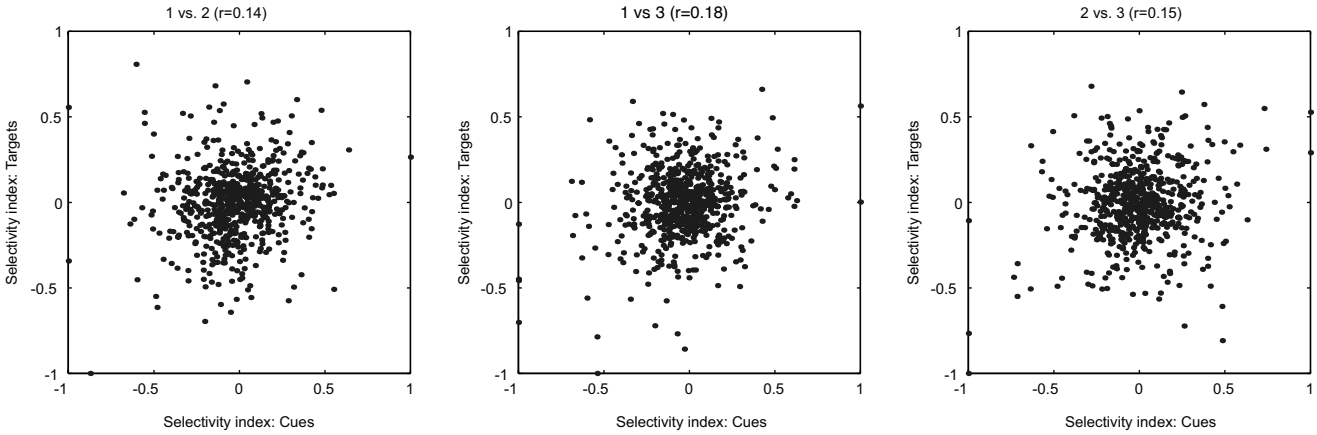


**Fig. S3.** Stimulus selectivity at cue and target phases. For each pair of trial types (12, 13, 23), selectivity index for targets is plotted against selectivity index for cues. Each point represents data from a single cell and hemifield, for a total of 648 points (324 cells × 2 hemifields) per plot.

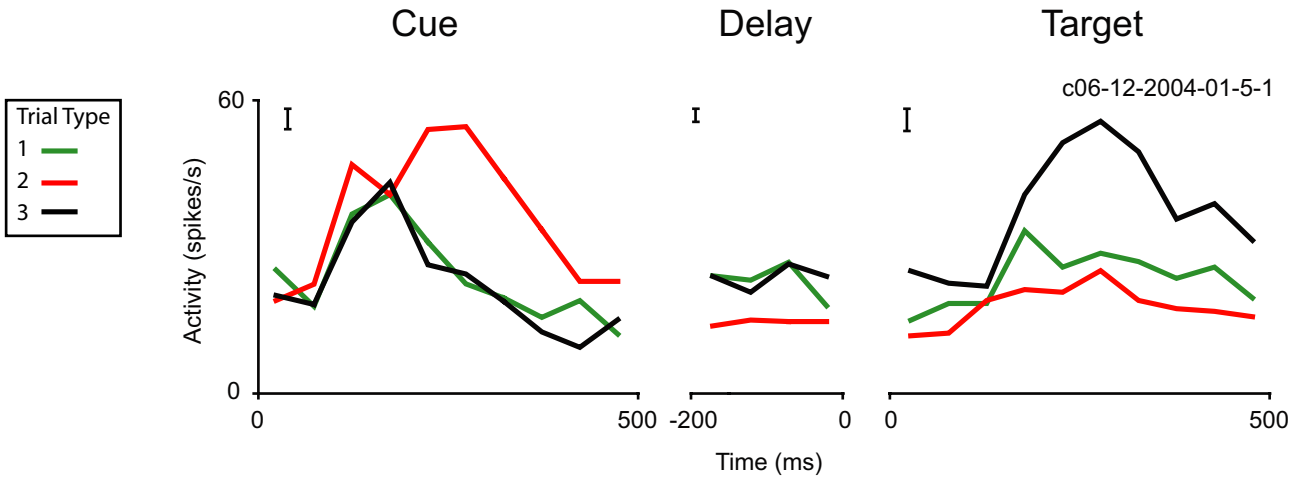


**Fig. S4.** Example cell with mismatched cue and target preferences. At the cue phase, this cell showed a significant preference for cue 2 ($P < 0.001$); at the target phase, there was significant preference for target 3 ($P < 0.001$). Data are from the contralateral hemifield; timing and conventions as in Fig. S2.