Supporting Information

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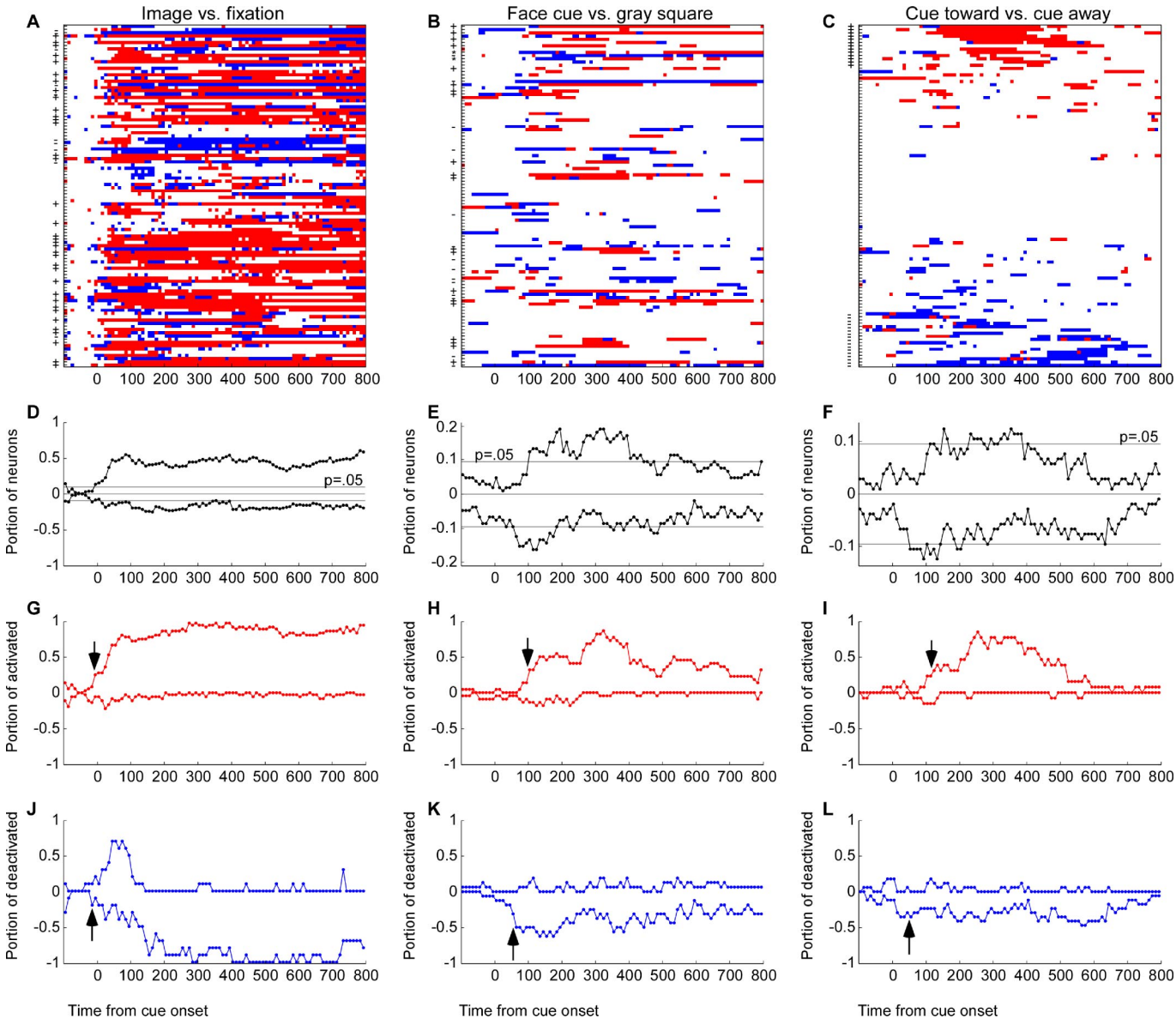

Fig. S1. The LIP population develops sensitivity to lower- before higher-level visuosocial cue dimensions. Columns plot, from left to right, the time course of significant modulation by (*A*) image fixation, (*B*) image type, and (*C*) social gaze cue direction. Population responses first differentiate image onset, then social images, and lastly respond to deictic signals. This holds whether looking across the population (black, *D–F*); at only neurons that significantly preferred image onset, social images, or cues toward response field (RF) (red, *G–I*); or at only neurons significantly suppressed by image onset, social images or gaze cues (blue, *J–L*). On these lower plots (*G–L*), arrows mark the time at which the population response became significant (2-tailed α, $P = 0.05$). Across all contrasts, suppressive neurons (blue, *J–L*) appeared to be activated earlier, but with lower temporal coherence. Most crucially, the responses of gaze-activated neurons differed significantly from those of gaze-suppressed (KS test, $P = 10^{-9}$), and only socially-cued modulations in gaze-activated neurons clustered significantly in time [KS test, $P = 10^{-11}$ for activated (*I*) vs. $P > 0.1$ for suppressed (*L*)].

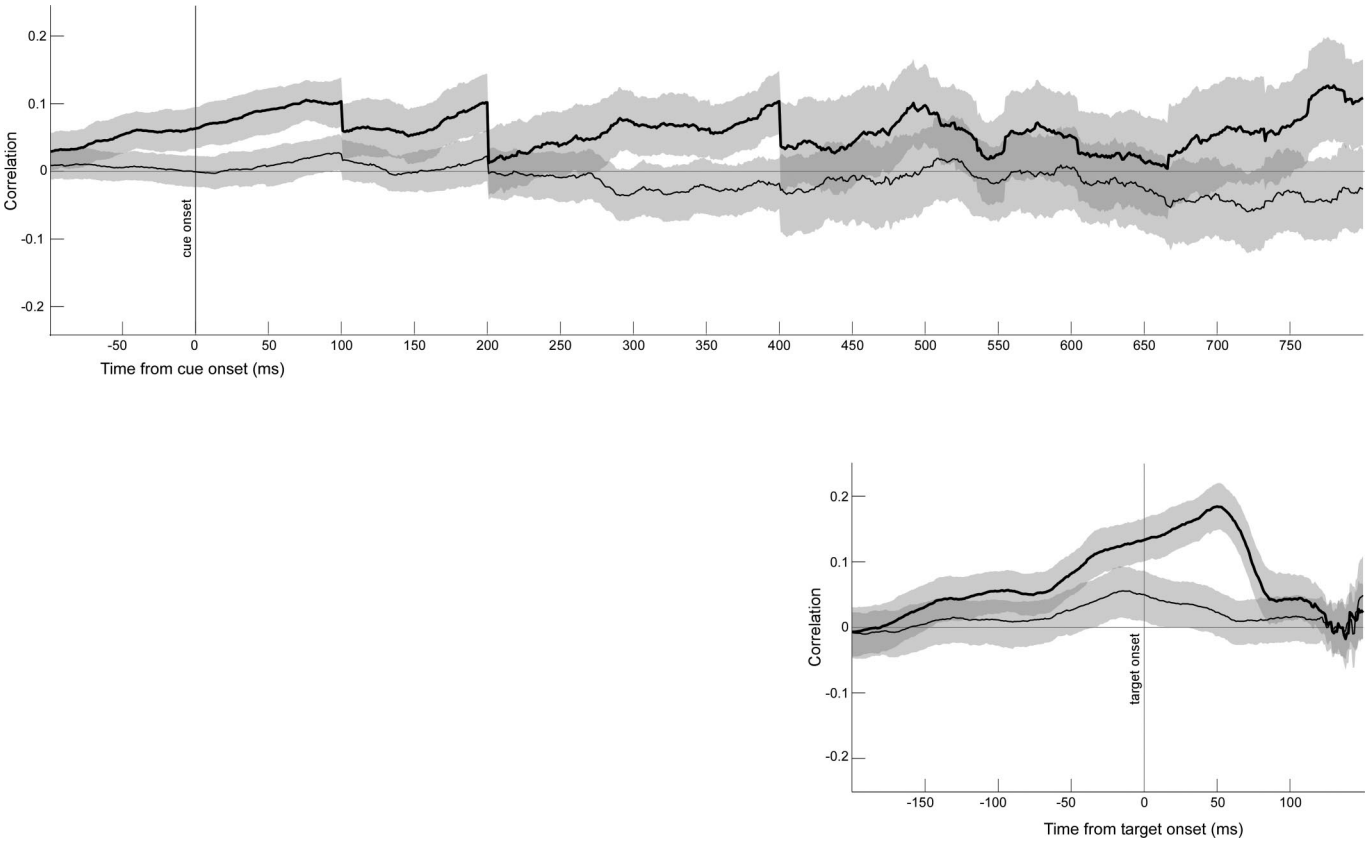

Fig. S2. Population activity predicts decreased saccade latency. Firing rates in neutrally-cued trials predicted decreased reaction times both (*A*) during the cue period, and (*B*) during saccade preparation. Using only trials in which a gray square appeared rather than a social gaze cue, firing rate strongly predicted decreased saccade latency near the end of a cue duration (before 100, 200, 400, and 800 ms). However, peak correlations were achieved during the period intervening between target onset and saccade onset. These correlations were pronounced only when the target appeared in the RF of the neuron (thick lines). Thus, additional neuronal activity in lateral intraparietal area (LIP) would result in gaze following primarily if it occurred immediately before target onset or during saccade preparation.