Supporting Information

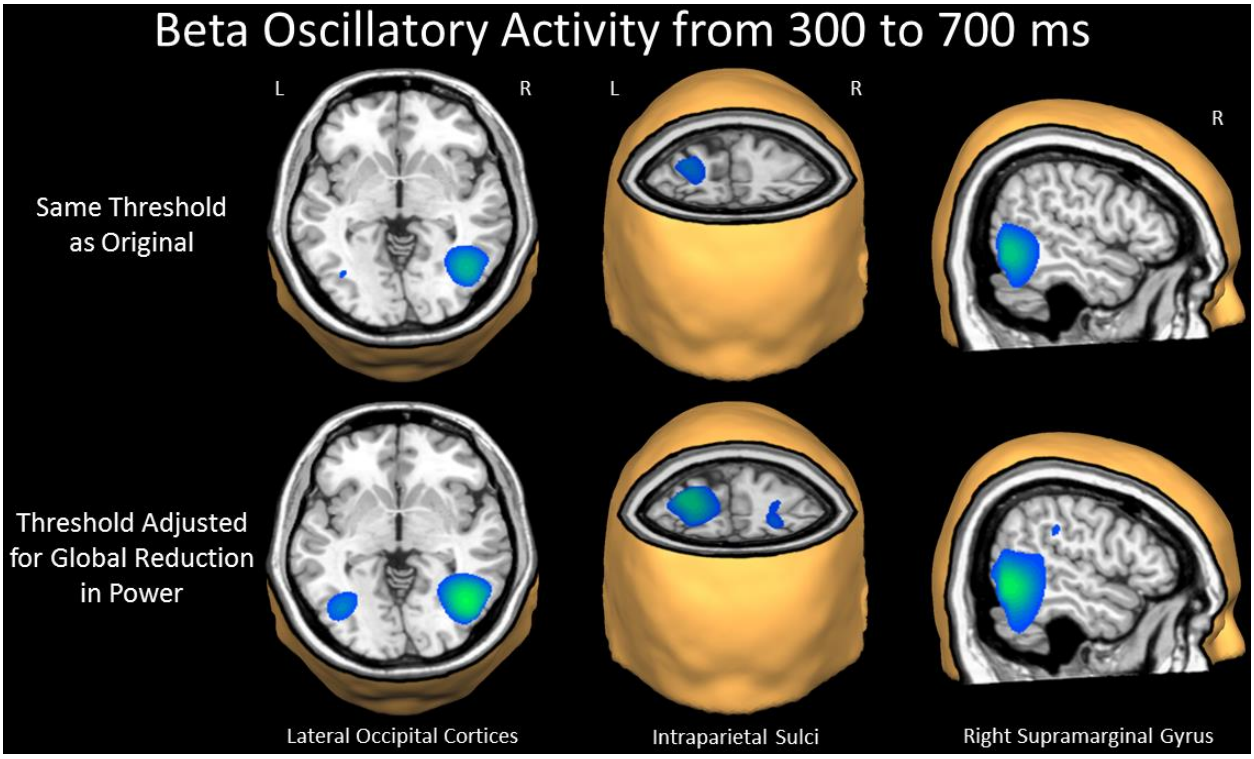

Figure S1. Beamformer results from the motor-response control analysis, depicting beta (14-24 Hz) activity during the first 400 ms of target processing. The top row demonstrates the results using the exact same pseudo-t threshold and slices as our original maps (Figure 5). The bottom row shows the results after adjusting the pseudo-t threshold to appropriately account for the overall lower beta power across the whole-brain map. Nearly identical beta responses were found using the shorter 300-700 ms time window, but these responses were weaker than their counterparts computed using the 300-900 ms time window (compare to Figure 5).

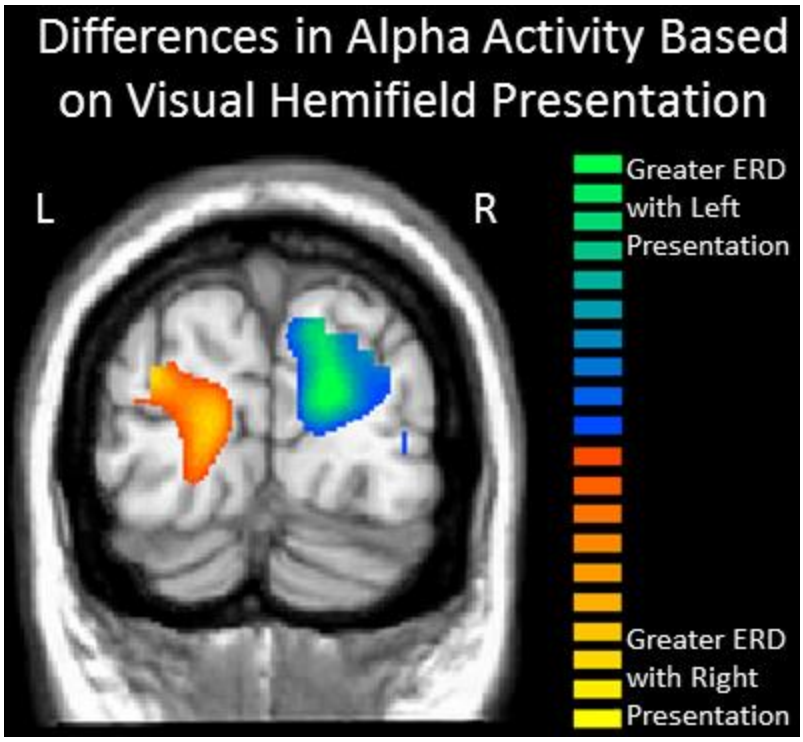

Figure S2. Beamformer results from the visual-laterality control analysis. Trials were split into two conditions, those in which the target was presented in the left visual hemifield, and those in which the target was presented in the right visual hemifield. The visual alpha (8-14 Hz) responses were beamformed for the two conditions (left and right) independently, and paired-sample t-tests were used to calculate a statistical parametric map showing regions with significant differences between the left and right hemifield conditions. The output map is thresholded at $p < .01$. Significant visual hemifield-related effects were observed in bilateral occipital cortices. Across conditions, strong decreases in alpha activity were observed in bilateral occipital regions, but these decreases were significantly stronger in the left hemisphere following right visual hemifield presentation, and in the right hemisphere for left visual hemifield presentation. ERD = event-related desynchronization.

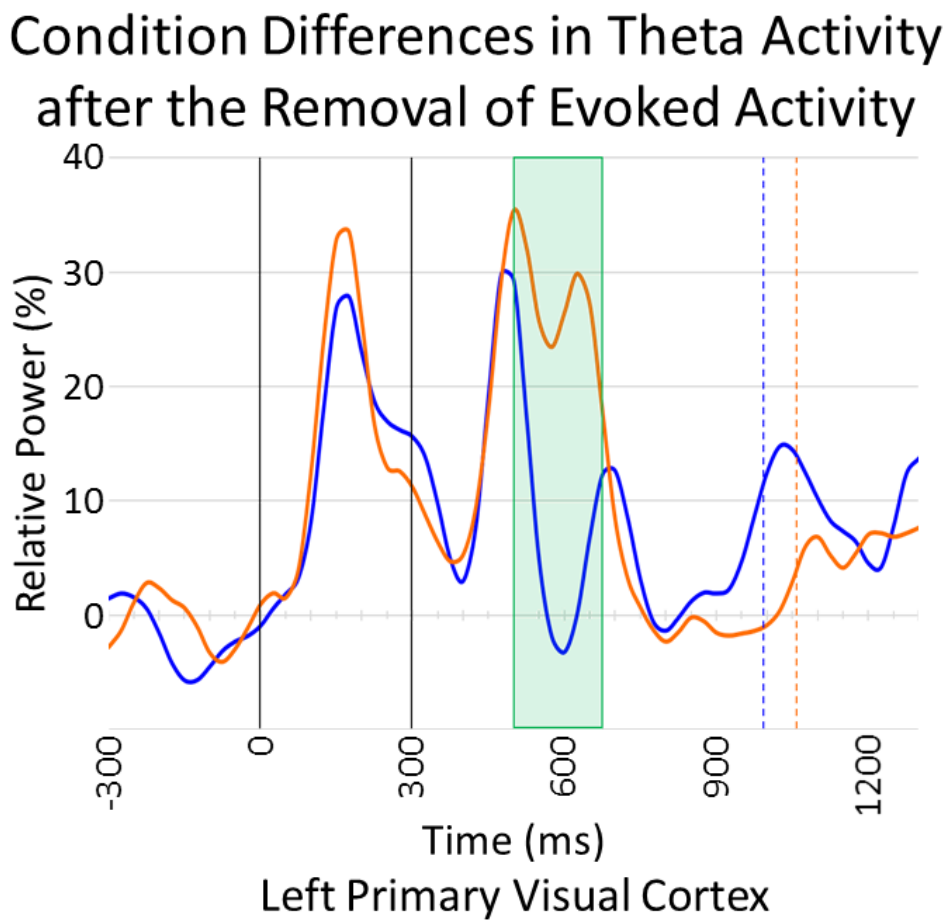

Figure S3. Time courses of theta activity from the peak voxel in the left primary visual cortex cluster (shown in Figure 3) after the removal of evoked activity for valid (blue) and invalid trials (orange). Time periods where significant differences ($p < 0.05$, corrected) were found between conditions are denoted with green boxes. Theta activity was stronger during the processing of invalid relative to valid targets from 500 to 675 ms.

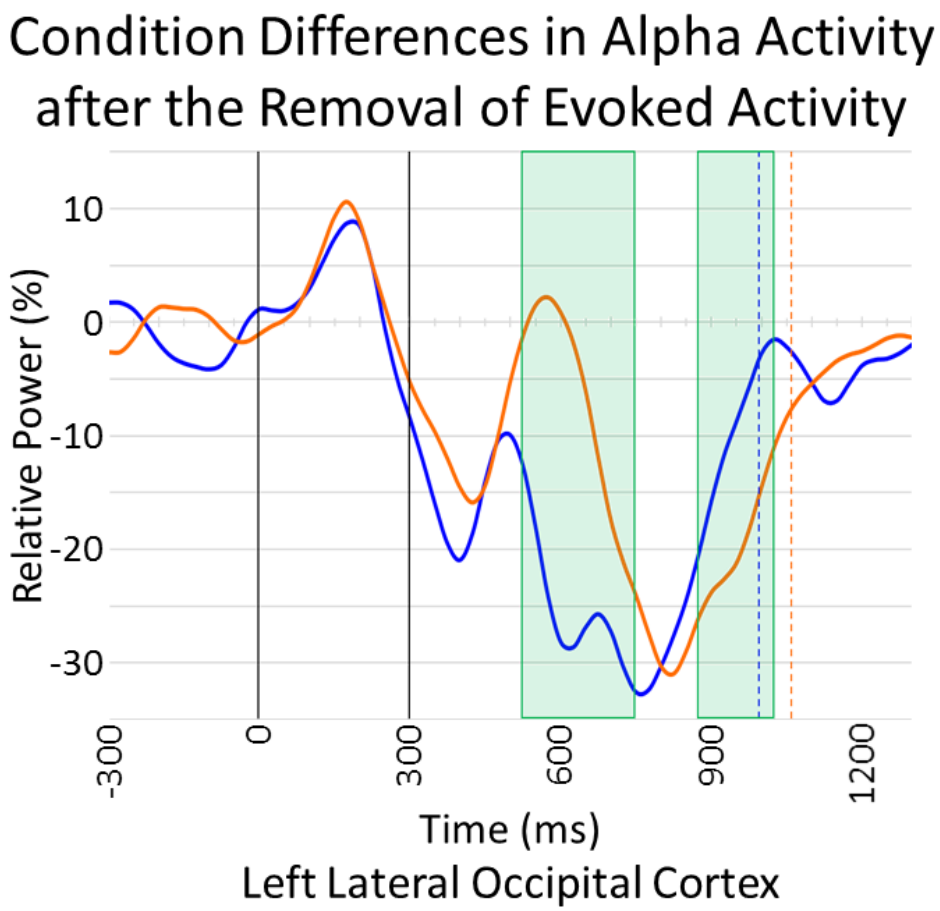

Figure S4. Time courses of alpha activity from the peak voxel in the left lateral occipital cortex cluster (shown in Figure 4) after the removal of evoked activity for valid (blue) and invalid trials (orange). Time periods where significant differences ($p < 0.05$, corrected) were found between conditions are denoted with green boxes. Greater reductions in alpha activity were observed during valid relative to invalid target processing from 525 to 750 ms, while the opposite pattern was observed from 875 to 1025 ms.

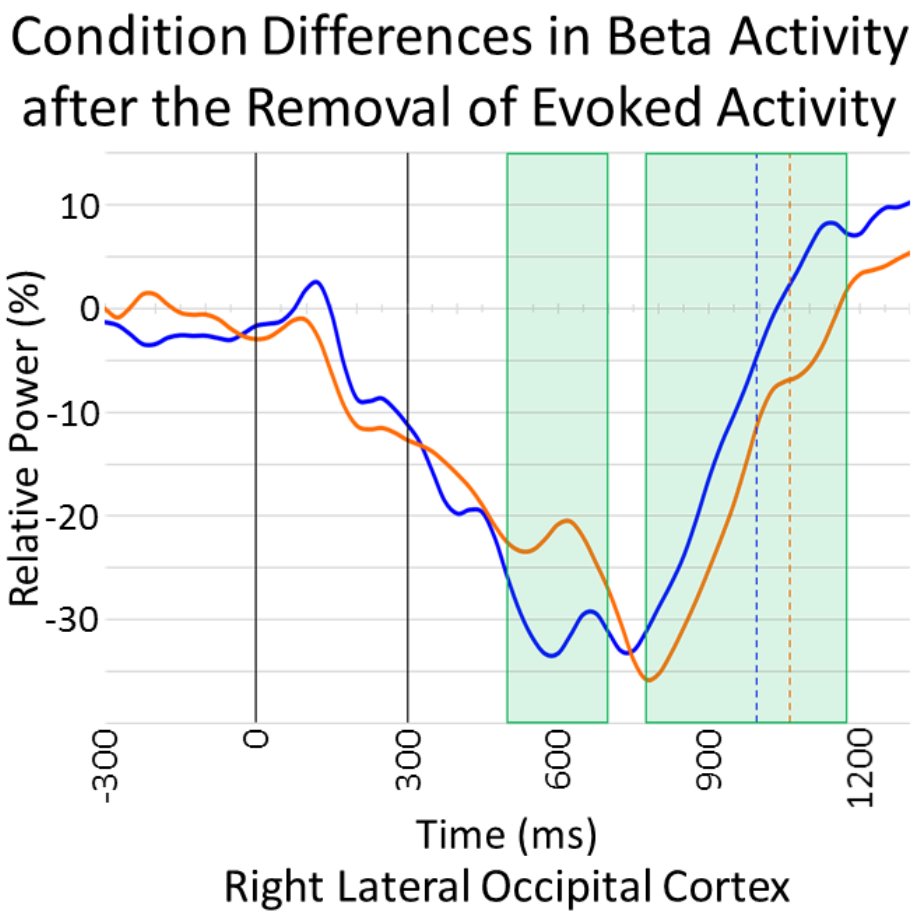

Figure S5. Time courses of beta activity from the peak voxel in the right lateral occipital cortex cluster (shown in Figure 5) after the removal of evoked activity for valid (blue) and invalid trials (orange). Time periods where significant differences ($p < 0.05$, corrected) were found between conditions are denoted with green boxes. Greater reductions in beta activity were observed during valid relative to invalid target processing from 500 to 700 ms, while the opposite pattern was observed from 775 to 1175 ms.