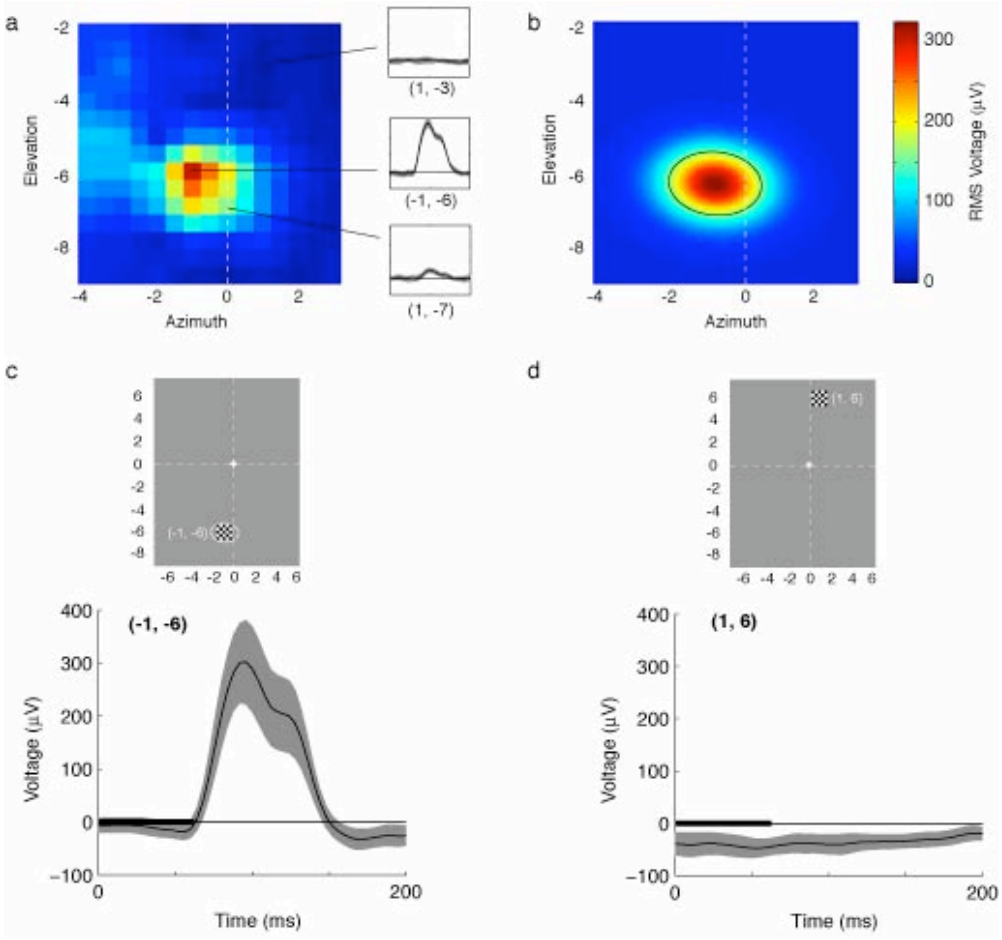
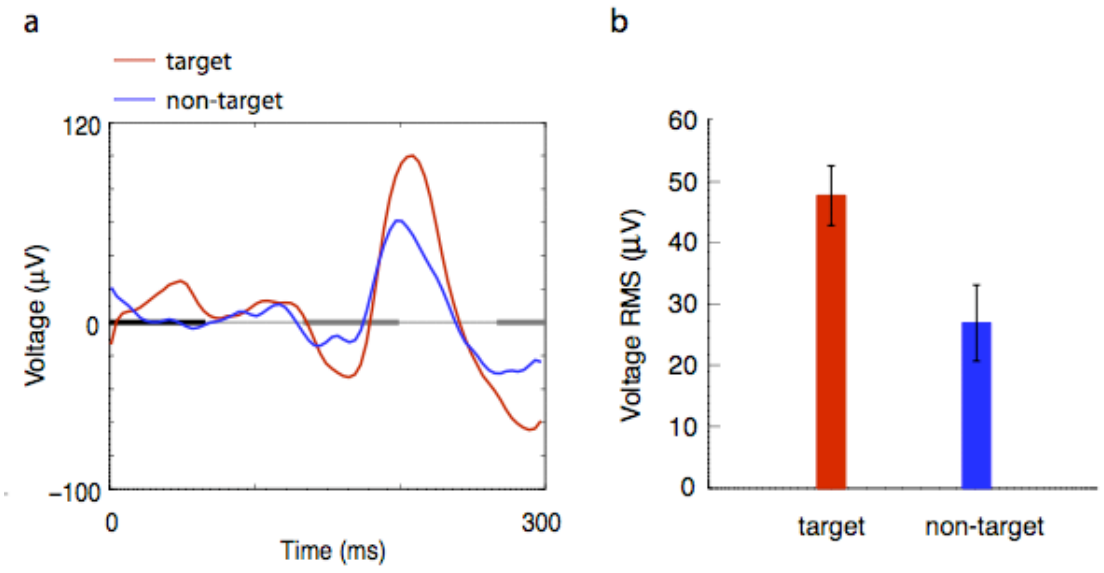
Supplementary Figure 1



Receptive field mapping from a surface electrode.
An electrode was positioned on the right occipital pole, immediately superior to the calcarine sulcus. While the subject performed a letter detection task at screen center, behaviorally irrelevant checkerboard stimuli were rapidly presented at different positions in the visual field. Stimulus-evoked local field potentials were recorded for each position and the response strength for each position was quantified by calculating the root mean square (RMS) deviation averaged over multiple stimulus presentations (a). These data were then fit to a two-dimensional Gaussian function to define an elliptical receptive field (RF) (b). The size of the RF obtained from this representative subject (Subject 1 in Fig. 2, also depicted in Fig. 1b) and was 1.6°, as determined by averaging the full widths at half height for the major and minor axes from the fitted Gaussian. The mean RF size for the individual electrodes used in each of the 6 subjects was 1.4° (SD 0.6). The eccentricity of the RF from this sample subject was 6.0° and the mean RF eccentricity for all electrode locations used in this study was 3.8° (SD 1.8). Before proceeding to the attention task, a final mapping run was performed to confirm the presence of a robust visual response to stimuli within the mapped RF and the absence of a response to stimuli in the diametrically opposite location in the visual field. In all cases the stimulus inside the RF (hatched oval) produced a strong visual response (c), while no significant response was produced for stimuli in the opposite location (d). Gray areas around voltage traces indicates 95% confidence intervals.

Supplementary Figure 2



Example of robust modulation of the visual responses in late extrastriate cortex.
(a) Recordings were made from an electrode in the ventral temporal lobe while a subject performed a rapid serial visual presentation task. An initial set of measurements identified objects that produced a strong response from this recording site (preferred stimuli). Subjects then maintained fixation on a cross at screen center while multiple images, including both preferred and non-preferred stimuli, were presented at 6 Hz and with a duty cycle of 50%. At the start of each block of trials, the subject was instructed to press a button with the appearance of a target object. The averaged response from the "non-target" condition (blue) is the visual response to one preferred stimulus when presented as a distractor, while the "target" condition (red) demonstrates the robustly enhanced response to the appearance of the same stimulus in trials when it the target. (b) RMS voltages for the two conditions demonstrate a robust (AI 0.28, 78%) and significant ($p<0.02$) modulation in the visual response when attention was directed to the object. Error bars are the standard errors. This and similar robust modulations in other subjects document that the method can detect large modulations of attention