

## Supplementary Note

### Shuffling Control

While our data indicate that FFA activation is correlated with both face detection and face identification, it remains possible that subjects' ability to detect and identify some face images stemmed from differences in the stimuli, which in turn produced the fMRI results. To test this possibility, we shuffled the pairings of behavioral responses with fMRI data across subjects (i.e., subject X's behavioral data were used to deconvolve subject Y's fMRI activations). We reasoned that if differences in the activation levels on different trials were induced by specific pictures, subjects' behavioral responses would be correlated, and therefore one subject's behavioral data would predict another subject's brain activation. If instead the differences between activation levels on different trials reflect individual subjects' percepts, then shuffling the behavioral data across subjects would reduce the differences between conditions.

**Fig. 2f** demonstrates the result of shuffling with one permutation of responses. **Fig. 2e** shows the average across all permutations; ANOVAs and statistical significance were calculated across all 20 possible permutations of subjects' behavioral responses. Indeed, when subjects' behavioral and fMRI data are shuffled, the differences between conditions (**Fig. 2e-g**) no longer reached statistical significance (shuffled: identification hits versus detection hits, right:  $P > 0.15$ ; left:  $P > 0.3$ , t-test; detection hits versus detection misses, right:  $P > 0.2$ , left:  $P > 0.1$ , t-test). Therefore, the higher FFA BOLD signal on trials in which faces were successfully identified or detected does not simply reflect differential responses to different stimuli.

### Involvement of Retinotopic Regions in Detection and Identification

Finally, we asked whether the success effects measured in high-level visual areas were driven by differential patterns of eye blinks. This hypothesis predicts a lower response in low-level visual areas such as V1 on detection miss trials than either detection or identification hit trials. Our direct search for regions correlated with successful identification did not find such effects in retinotopic regions (**Fig. 6**). The most straightforward interpretation is that the activation in high-level visual areas is predictive of success at object and face identification, but the activation in retinotopic areas is not. However, because our experiment did not contain a fixation baseline condition, it did not provide a robust measure of V1 activation. To directly measure the involvement of early retinotopic areas in object and face detection, we conducted a control experiment in which we changed the baseline condition to a blank stimulus (with a fixation cross), in order to measure V1 activation. This control experiment was performed on five non-expert subjects (three of the subjects also participated in the original experiment) and two categories (faces and guitars). Subjects saw the same images and performed the same tasks as in the first experiment.

The control experiment revealed that activation in retinotopic cortex was robust, but not different for identification hits, detection hits or detection misses (**Supplementary Fig. 1**, online). In contrast, we replicated our previous results for the FFA (**Supplementary Fig. 1**, online): activation was correlated with subjects' performance at face detection and identification. These data indicate that the differences between identification hits, detection hits and detection misses is not a consequence of eye blinks.