

Supporting Information

Yi et al. 10.1073/pnas.0802525105

SI Text

Other Face-Selective ROIs. In both experiments, beyond the fusiform gyrus and lateral occipital cortex, regions in the middle/superior temporal gyrus were more responsive to faces than scenes during the localizer run [Ishai A, Ungerleider LG, Martin A, Haxby JV (2000) The representation of objects in the human occipital and temporal cortex. *J Cogn Neurosci* 12 (Suppl 2):35–51]. In the right hemisphere, this ROI was defined in 15 subjects ($x = 56, y = -56, z = 9$) in experiment 1 and 9 subjects ($x = 53, y = -49, z = 7$) in experiment 2. In the left hemisphere, it was defined in 11 subjects ($x = -51, y = -54, z = 10$) in experiment 1 and 8 subjects ($x = -52, y = -51, z = 5$) in experiment 2. During the main task, however, none of these ROIs was sensitive to our experimental manipulations; there were no significant main effects, interaction, or pairwise differences between conditions in either experiment (P values > 0.1).

Exploratory Whole-Brain Analysis. In experiment 1, the same general linear model as in the region-of-interest analysis was applied to each voxel across the entire brain. A two-stage random-effect analysis was then performed by using a one-sample t test on contrast images obtained from every subject, separately for each comparison of interest. Resulting SPMs of the t statistic ($df = 19$) at each voxel were thresholded at $P < 0.001$ (uncorrected, cluster threshold $k = 5$).

We first explored the brain regions that may be involved in integrating identity information from both surface features and spatiotemporal cues. Specifically, by examining regions that respond more strongly when these cues conflict (i.e., the unrepeated-continuous and the repeated-discontinuous conditions) than when they agree (i.e., the repeated-continuous and the unrepeated-discontinuous conditions), we hoped to identify a cortical network that resolves coherent object representations. Such regions can be identified by a significant cross-over interaction between facial features (repeated vs. unrepeated) and spatiotemporal continuity (continuous vs. discontinuous).

The five distinct regions were identified in this analysis (Fig. S3). Right inferior frontal sulcus ($x = 42, y = 41, z = 1$), right superior parietal lobule ($x = 52, y = -36, z = 41$), and left precuneus ($x = -12, y = -62, z = 47$) had stronger fMRI responses when face identity and spatiotemporal continuity cues conflicted. Such activations may reflect processes related to resolving conflicting visual cues for object identity. In contrast, left middle temporal gyrus ($x = -53, y = -61, z = 1$) and right middle fusiform gyrus ($x = 39, y = -64, z = -7$) nearly replicated the results from the right FFA ROI. These results provide some initial indication of the mechanisms involved in assimilating different kinds of visual cues to object persistence. For example, spatiotemporal effects in ventral visual cortex may be controlled by the broad frontoparietal network observed in this analysis.

In further analyses, the main effect of facial features produced attenuation in the voxels spanning the fusiform gyrus and the lateral occipital cortex in both hemispheres. In contrast, there was no main effect of spatiotemporal continuity in any cortical regions, again indicating that there was no adaptation to repeating motion *per se*.

In experiment 2, however, no voxels survived statistical tests searching for a two-way interaction, probably because of the smaller number of participants. In addition, as was the case in the ROI analyses, the whole-brain analysis did not reveal statistically significant activation associated with featural repetition. In contrast, the continuous path conditions produced greater activation than the discontinuous path conditions in medial frontal gyrus ($x = -6, y = 52, z = -5$), whereas the discontinuous path conditions produced greater activation than the continuous path conditions in inferior temporal gyrus ($x = -45, y = -53, z = -5$) and lingual gyrus ($x = 15, y = -76, z = -1$). It is perhaps not surprising that there would be some differences in the results of experiments 1 and 2, given that they used such different displays and manipulations, but it is striking that the primary result of interest—that spatiotemporal continuity influences “sameness” in ventral cortex—was so consistent across these very different studies.

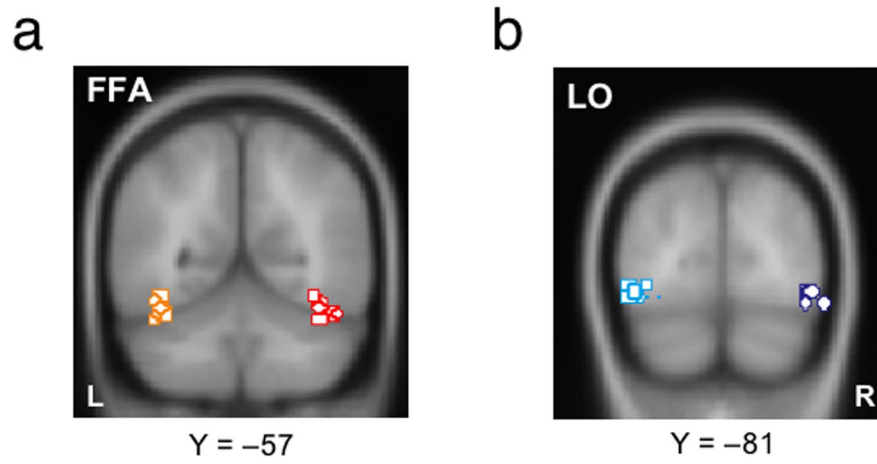
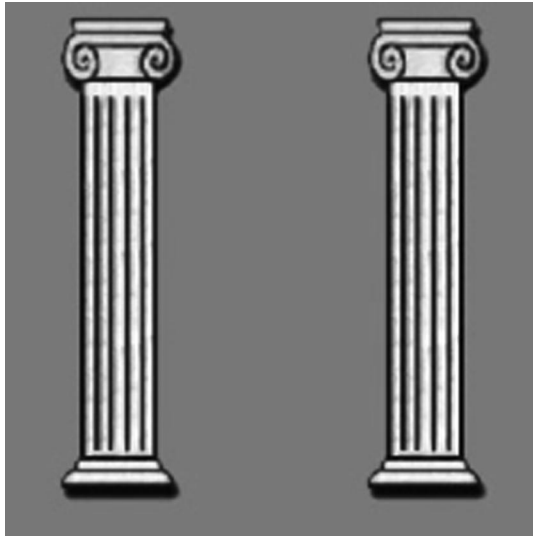
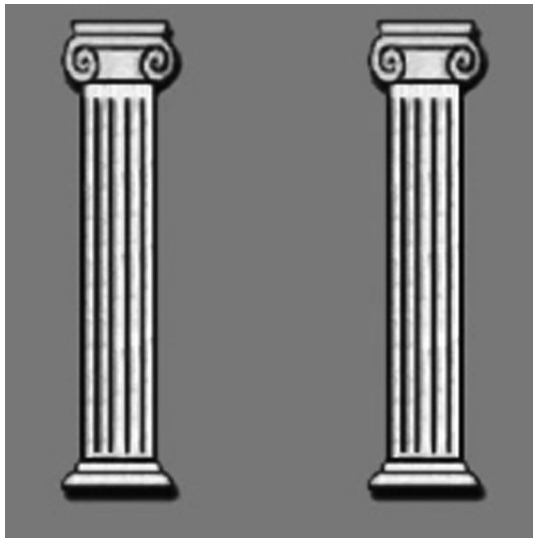


Fig. S1. Face-selective ROIs in experiment 1. (a and b) Two coronal sections show the locations of bilateral ROIs from individual observers overlaid on the average T1-weighted template image (orange, left FFA; red, right FFA; cyan, left LO; blue, right LO).



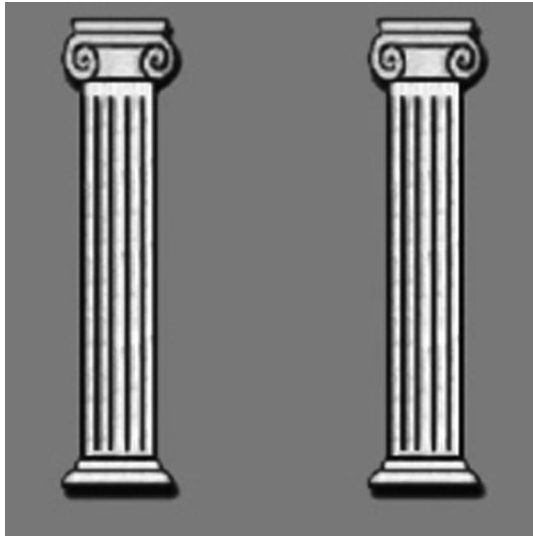
Movie S1. Example of the repeated-continuous condition in experiment 1. A featurally identical face repeatedly appeared from the same column.

[Movie S1](#)



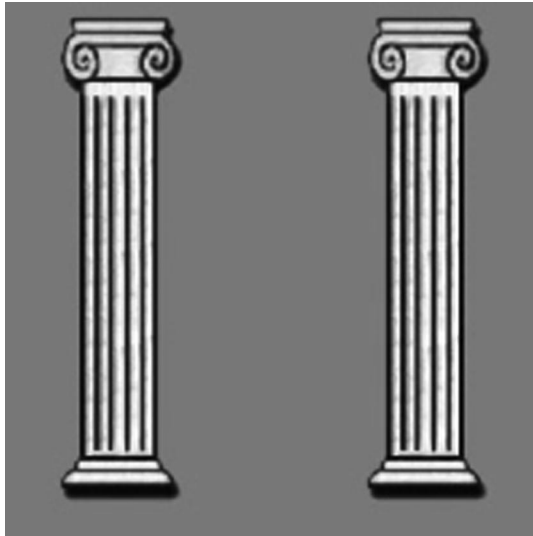
Movie S2. Example of the repeated-discontinuous condition in experiment 1. A featurally identical face appeared subsequently from each of the two columns.

[Movie S2](#)



Movie S3. Example of the unrepeated-continuous condition in experiment 1. Two featurally distinct faces appeared from the same column.

[Movie S3](#)



Movie S4. Example of the unrepeated-discontinuous condition in experiment 1. Two featurally distinct faces appeared subsequently from different columns.

[Movie S4](#)



Movie S5. Example of the repeated-continuous condition in experiment 2. A featurally identical face repeatedly appeared within the same apparent motion stream.

[Movie S5](#)



Movie S6. Example of the repeated-discontinuous condition in experiment 2. A featurally identical face appeared successively in each of the two apparent motion streams.

[Movie S6](#)



Movie S7. Example of the unrepeated-continuous condition in experiment 2. Two featurally distinct faces appeared within the same apparent motion stream.

[Movie S7](#)



Movie S8. Example of the unrepeated-discontinuous condition in experiment 2. Two featurally distinct faces appeared successively in each of the two apparent motion streams.

[Movie S8](#)