Neuron, Vol. 35, 793–801, August 15, 2002, Copyright ©2002 by Cell Press

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the most important role in the long-term representation and categorization of objects in the visual world. But what about the object-related activation that has been found in area cIPS? It has been suggested that this region of the posterior parietal cortex might be part of a human homolog of the monkey dorsal stream (Culham and Kanwisher, 2001). One function of the dorsal stream appears to be the visual control of skilled actions, such as object-directed grasping movements (Goodale and Milner, 1992). Therefore, the activation seen in area cIPS may reflect some sort of object processing that is related to action (Faillenot et al., 1997; Shikata et al., 2001). Thus, it is possible that the patterns of activation seen in areas LOC and cIPS reflect fundamentally different processes, one related to object perception, the other to object-directed actions. If this is the case, then the effects of priming on activation in areas LOC and cIPS might also be different, and could mirror the effects that have been shown to occur in object recognition and the visual control of action.

In everyday life, we are able to recognize objects we have seen before even when we encounter them from

shown either at the identical view or at a different view. An initial behavioral experiment (Experiment 1) demon-

arately for each experiment). This ROI fell on the temporal-occipital boundary of the fusiform gyrus and was thus termed the ventral temporal-occipital area (vTO).

Figure 1. Stimuli and Imaging Protocols

(A) In Experiment 2, images of objects were presented to subjects in two separate runs. Each run began with 27 s of fixation and was followed by stimulus presentation blocks of 12 stimuli each. These stimulus blocks alternated between presenting intact objects and scrambled objects. The 12 objects that were presented in the first intact object block (A-30°) of a run were different from the 12 objects presented during the second intact object block (B-30°). The objects that were presented during the third and fourth intact object blocks (A-330°, B-330°) were the same objects that were presented in the first and second intact object blocks (A-30°, B-30°), but were rotated 60° in depth. Every stimulus was presented for 2.25 s, resulting in a total presentation time of 27 s for each entire block. The sets of objects that were presented in the second run were identical to those presented in the first run. In Experiment 3, images of objects were presented to subjects in a single run. It began and ended with 18 s of fixation; between which, there were stimulus presentation blocks of 12 stimuli each. These stimulus blocks alternated between presenting intact objects and scrambled objects. The 12 objects that were presented in the first intact object block (A-30°) of a run were different from the 12 objects presented during the fourth intact object block (B-150°). The objects that were presented during the third and fifth intact object blocks (A-330°, B-210°) were the same objects that were presented in the first and fourth intact object blocks (A-30°, B-150°), but were rotated 60° in depth. The images that were presented during the second and sixth intact object blocks (A-30°, B-150°) were the identical images that were presented in the first and fourth intact object blocks. Every stimulus was presented for 1.5 s, resulting in a total presentation time of 18 s for eachob228.6(5time)-[

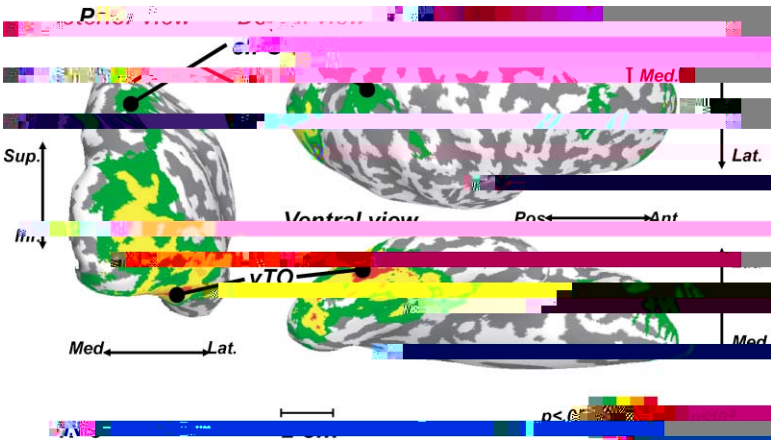

Figure 2. Results of Experiment 2

Brains are "inflated" to show activation within the sulci. Gyri appear in light gray and sulci appear in dark gray. Posterior, dorsal, and ventral views of only the right hemisphere are shown, but activation in the left hemisphere was similar. The activation map was generated from the data of eight subjects. All activated regions showed higher activation with intact than with scrambled objects. The lateral occipital complex (vTO) (Talairach coordinates: RH, $x = 43$, $y = -55$, $z = -24$; LH, $x = -37$, $y = -50$, $z = -24$) is indicated on the posterior and ventral views. The caudal part of the intraparietal sulcus (cIPS) (Talairach coordinates: RH, $x = 32$, $y = -69$, $z = 45$; LH, $x = -29$, $y = -68$, $z = 45$) is indicated on the posterior and dorsal views. The vTO and cIPS ROIs each included an area of cortical surface that was approximately 350 mm^2. Significance levels are uncorrected.

In Experiment 2, both novel and common objects were used. The novel objects were not used in Experiment 3 because, in Experiment 2, they produced the same basic pattern of activation as the common objects (Figure 5); that is, there were no interactions between familiarity 2, such that the initial presentation of object set B resulted in significantly lower activation than the initial presentation of object set A in area cIPS ($t_{(7)} = 2.72$, $p < 0.05$), but not in area vTO ($t_{(7)} = 1.25$, ns). Despite this difference, however, there was only a nonsignificant

Figure 4. Priming Ratios and Order Effects

(A) The vertical axis indicates the amount of activation produced while viewing the repeated rotated objects (R), expressed as a percentage of the activation produced while viewing the initial presentation (N), using the activation during viewing of identical repeated objects (I) as the zero percent mark. A high value indicates that activation for the rotated objects was close to that of the initial

into 2304 squares in a 48 ×