Dissociation between ventral and dorsal fMRI activation during object and action recognition

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Created 7/4/2011
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Abstract:

Neuropsychological case studies suggest the existence of two functionally separate visual streams: the ventral pathway, central for object recognition; and the dorsal pathway, engaged in visually guided actions. However, a clear dissociation between the functions of the two streams has not been decisively shown in intact humans. In this study, we demonstrate dissociation between dorsal and ventral fMRI activation patterns during observation of object manipulation video clips. Parietal areas, such as anterior intraparietal sulcus (aIPS) display grasp viewing-dependent adaptation (i.e., fMR adaptation during repeated viewing of the same object-grasping movement) as well as a contralateral preference for the viewed manipulating hand. Ventral regions, such as the fusiform gyrus, show similar characteristics (i.e., adaptation, contralateral preference), but these depend on object identity. Our results support the hypothesized functional specialization in the visual system and suggest that parietal areas (such as aIPS) are engaged in action recognition, as well as in action planning.

Journal: Neuron

Volume: 47

Pagination: 457-470

Date Published: aug

Notes: {PMID:} 16055068
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