
Hemispheric differences of color responses in human ventral visual cortex

Hemispheric differences of color responses in human ventral visual cortex. Derrik E. Asher and Alyssa A. Brewer; J Vis August 5, 2009 9(8): 776; doi:10.1167/9.8.776

INTRODUCTION. Human ventral occipito-temporal cortex (VOT) has been shown to contain several visual field maps involved in the color and shape processing pathways (Brewer et al., 2005; Arcaro and Kastner, 2007). Patient lesion studies indicate that there may be hemispheric differences in the pathways subserving color vision and word form recognition. Here we compare the organization of the color responses between hemispheres in human ventral visual cortex.

METHODS. We first used fMRI to measure angular and eccentric retinotopic organization in VOT to define areas hV4, VO-1, and VO-2. Rotating wedge and expanding ring stimuli consisted of black and white, drifting radial checkerboards 3° in diameter. Next, color-responsive regions were isolated with localizer scans using luminance-matched chromatic and achromatic Mondrian patterns. We measured the color responses with respect to these maps and compared the pattern of the color responses between hemispheres. Finally, we measured and compared the population receptive fields in these maps and the surrounding ventral cortex (Dumoulin and Wandell, 2008).

RESULTS. Our measurements demonstrate a hemispheric difference in the organization of the color-selective regions just lateral to VO-1 and VO-2. The ventral cortex just lateral to VO-1 and VO-2 in the right hemisphere was strongly color-responsive, while the homologous region in the left hemisphere showed no preference between chromatic and achromatic stimuli.

CONCLUSION. These results suggest that there may be a lateralization of the color-processing pathway in human VOT.

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