DIFFERENCES IN PROCESSING OF 3-D SHAPE FROM MULTIPLE CUES IN MONKEY CORTEX REVEALED BY fMRI. M.E. Sereno[1,2]*, M. Augath[2], and N.K. Logothetis[2]. 1. Psych Dept., Univ. of Oregon, Eugene, OR, USA. 2. Max Planck Institute for Biological Cybernetics, D-72076 Tübingen, Germany.

Previous work using fMRI in anesthetized monkeys to investigate the representation of 3-D objects and surfaces suggests a set of candidate areas in monkey cortex for cue-invariant 3-D shape processing (Sereno et al., Neuron, 2002). The present study examines activation overlap for 3-D surface shape defined with 3 different cues by directly comparing activation for the same 3-D shapes in the same monkey subjects. Stimuli consisted of a set of 3-D surfaces defined by dynamic (random dots with motion parallax) and static (shading and contour) shape cues. Each shape defined by a particular cue was paired with a control stimulus consisting of a scrambled or disrupted cue gradient to diminish or abolish an impression of depth. Activation from a comparison of intact to control stimuli revealed regions of common activation (e.g., in superior temporal and intra-parietal sulci) for shape defined by the 3 different cues. However, significant differences between the dynamic and static cues emerged. The extent and strength of activation was greater in area MT for dynamic compared to static cues; whereas the opposite was true in area V4. In addition, while there was significant overlap across the cues in regions of the STS anterior to area MT (FST and mid-anterior STS), in each of these regions there was a greater number of voxels active for shape-from-motion stimuli in the fundus vs. the more lateral aspect of the ventral bank. In turn, the lateral aspect of the ventral bank had a greater number of voxels active for shape-from-shading and -contour compared to shape-from-motion stimuli. Between the regions activated primarily by dynamic or static cues there was a region of convergence activated by all the cues.

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