RESPONSES TO MOTION WITHIN THE VISUAL CORTEX OF THE DEAF

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Last year we showed that visual stimuli activate regions of auditory cortex (within Brodmann's areas 42 and 22) in the deaf that are not similarly activated in the hearing. It seems that auditory deprivation leads to cross-modal plasticity, with increased processing of visual stimuli within auditory cortex in the deaf (Finney, Fine and Dobkins, *Nature Neuroscience*, 2001). It seems possible that early deafness in humans may also lead to compensatory plasticity in remaining intact modalities. We used functional magnetic resonance imaging to compare activation to visual stimuli in deaf and hearing subjects within occipital areas including V1, V2, V3 and V4 and the MT/MST complex. We defined retinotopic areas and MT/MST using standard functional techniques. To compare the size and activation of MT/MST between deaf and hearing we plotted the number of voxels as a function of the correlation threshold. We found no significant differences in the size of retinotopic areas or MT/MST between deaf and hearing subjects. We also measured activations to a lateralized motion stimulus. Moving dots within a 10-degree aperture were presented in either the right or left visual peripheral field, while subjects fixated on a center fixation square. Subjects performed a task directing attention to either the moving dots (*attend-motion*) or to the stationary fixation square (*ignore-motion*). As to be expected, in both deaf and hearing we found large responses when the aperture was presented in the contralateral visual field. Contralateral responses were larger in the *attend-motion* condition than in the *ignore-motion* condition, while there was no effect of attention in the ipsilateral visual field. We did not find any differences in overall activation or in attentional effects between deaf and hearing within occipital cortex or MT/MST. These results suggest only limited compensatory plasticity within deaf visual cortex. Support: NSF-SBR9870897; NRSA-5F32; EY06919; EY01711; EY12925.