

VISUAL STIMULI ACTIVATE AUDITORY CORTEX IN THE DEAF

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Previous studies suggest that early deafness in humans leads to compensatory plasticity in remaining intact modalities. Using functional magnetic resonance imaging, we compared activation to visual stimuli in deaf and hearing subjects, and found that certain auditory areas were only activated in the deaf. We defined auditory regions of interest (ROIs) functionally in hearing subjects using music sequences. The visual stimulus (moving dots) was presented in either the right or left visual field, while subjects fixated on a center square. Subjects attended to either the moving dots (*attend-motion*) or to the stationary fixation spot (*ignore-motion*). Deaf subjects exhibited activation ($p < 0.01$; $n = 6$) in a region of the right auditory ROI, corresponding to parts of Brodmann's areas 42 and 22. Hearing subjects exhibited no activity in this region ($p > 0.55$; $n = 6$). There was a similar trend in the left auditory ROI, but differences between the deaf and the hearing did not reach significance. These results demonstrate that auditory deprivation leads to cross-modal plasticity, with increased processing of visual stimuli within auditory cortex in the deaf. Differences between groups were significant only for the *attend-motion* condition, suggesting that higher-level processes may amplify visual inputs to auditory regions. Support: NSF-SBR9870897 (KRD, IF); NRSA-5F32EY06919 (EMF); EY01711(IF)

CLEAN VERSION (245 words, but Eva needs to put some more stats in.