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Sensory competition in the face processing areas of the human brain

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The simultaneous presentation of several faces within the visual field may trigger sensory competition between the stimuli. This sensory competition has been already proved in case of two simultaneously presented faces behaviourally. In the present study we investigated the neuronal background of this effect in an event-related functional magnetic resonance imaging (fMRI) study while subjects (n=12) were presented simultaneously four peripheral stimuli out of which either one or two or four were human faces while the rest was always Fourier phase-randomised noise image. The activation patterns of face- (fusiform and occipital face areas (FFA and OFA)) and object-selective cortical areas (LOC) were different. The right FFA showed the highest activation if a single human face was presented and its activity decreased parallel to the increasing number of face stimuli. Interestingly, this sensory competition not only occurred if the number of stimuli was increased but it was also the function of the inter-stimulus distance: faces closer to each other led to stronger competition than more distant ones, separated by noise images.

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