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NEURAL BASIS OF FACE PROCESSING IN CHIMPANZEES AND MONKEYS USING FDG-PET

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Studies of the neural basis of face recognition in humans involve the use of divergent measurement methods including fMRI, PET, EEG and behavioral techniques. Recently, significant advances have been made regarding the evolution of face-selective processing in monkeys using similar techniques, such as fMRI and single cell electrophysiology. These studies reveal a series of interconnected face responsive regions throughout inferotemporal cortex of macaque monkeys. While humans share face-selective responses in some of these regions, they are largely lateral along the superior temporal sulcus while human face-selective regions are primarily ventro-medial in the temporal cortex, specifically the fusiform gyrus. Understanding whether the face responsive regions of chimpanzees are more similar to humans or macaques is an important and interesting question in comparative behavioral neuroscience. However, fMRI requires subjects to be awake and motionless in the scanner and single cell recording studies are invasive and neither technique is possible to perform in chimpanzees. This study reports the use of an alternative noninvasive functional neuroimaging method, FDG-PET, that can easily be performed on both chimpanzees and monkeys, providing important comparative data on the neural basis of cognitive, behavioral and perceptual processes. This study reports the results of two studies of face recognition using FDG-PET in chimpanzees and rhesus monkeys. Results suggest that face responsive regions in chimpanzees share some similarity with both the human and monkey patterns.

Keywords: face recognition, homology, neuroimaging, PET