

ENCODING OF MOTION IN NEAR EXTRAPERSONAL SPACE IN THE PRIMATE VENTRAL INTRAPARIETAL AREA (VIP)

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In humans and monkeys, damage to posterior parietal cortex (PPC) leads to polymodal disturbances of sensorimotor behavior such as hemispatial neglect or extinction, often being more pronounced in near than in far extrapersonal space. The macaque ventral intraparietal area (VIP) is part of a polymodal cortical network which subserves the encoding of motion in near extrapersonal space. Using polymodal motion stimuli and fMRI we recently demonstrated in human PPC the existence of an area that is functionally equivalent to macaque area VIP. In the present human fMRI study (n=10) we address the issue whether the human equivalent of macaque area VIP is also specifically involved in the processing of movement in near space.

Random dot patterns were presented in different virtual depths in a two-factorial design with factors space (near / far) and motion (moving dots / stationary dots). Functional MR images were processed using SPM99 software and analyzed for neural activations differentially induced by movement in near extrapersonal space ($P < 0.05$, corrected for multiple comparisons). Activity specifically related to movement in near extrapersonal space was observed bilaterally in the dorsal occipital cortex and along the intraparietal sulcus. The latter region of activation included the area previously identified as the human equivalent of macaque area VIP. The data thus provide further evidence for the notion that human and macaque area VIP share identical functional properties and might be essential for normal sensorimotor behavior.

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