Supplementary Methods

Case report

The patient was a male physician. His first stroke occurred in the left parieto-temporo-occipital cerebral area, producing right hemiplegia and transcortical sensory aphasia which receded rapidly, but also a persistent right hemianopia. The second hemorrhage occurred in the right occipital lobe and produced the loss of his remaining visual field. He was tested 3 to 5 months after this second episode.

Methods and Material

In order to participate in this study, the patient signed a written consent form approved by the local Ethics Committee. Due to the patient’s blindness, this form was read to him by his wife and was signed in her presence. Behavioral tasks were carried out on a laptop PC maintained at approximately 60cm in line with his direction of gaze. TN was informed when a stimulus had appeared on the screen and was urged to guess the category in which it fell. Although he was not timed, he was instructed to decide as rapidly as possible. In the procedures involving emotional expressions, 10 angry, 10 fearful, 10 sad and 10 happy faces from the Pictures of Facial Affect series were employed, each composed of 5 male and 5 female actors (P. Ekman & W. V. Friesen. (Consulting Psychologists Press, Palo Alto, CA, 1975)). Five neutral male and 5 neutral female faces from the same dataset were used for the gender task. For the face vs. non-face procedure, 5 photographs of expressionless female actors from our own dataset were used and the
scrambled non-face stimuli were created by modifying the location of the eyes, nose and mouth. All the stimuli used in the preceding experiments were static grayscale images subtending visual angles of $4.8 \times 6.8^\circ$. The emotional scenes and threatening/non-threatening animals were selected from the International Affective Pictures System (P.J. Lang, M.M. Bradley & B.N. (University of Florida: The Center for Research in Psychophysiology, 1999)), a standardized battery of digitized color photographs subtending $13.6^\circ$ vertically and between $11.8 - 18.4^\circ$ horizontally.

**MR acquisition.** Experiments were performed on a 1.5T Philips system (Best, The Netherlands). Multi-slice T2-weighted fMRI images were obtained with an EPI GRE sequence (TR/TE/Flip=2s/40ms/80°, FOV = 250mm, matrix = $128 \times 128$, 25 contiguous 3mm axial slices, voxel size = $1.95 \times 1.95 \times 3$mm). A high-resolution structural volume was obtained with a 3D GRE T1-weighted sequence (TR/TE/Flip = 15ms/5ms/30°, FOV = 250mm, matrix = $256 \times 256$, voxel size: $0.97 \times 0.97 \times 1.25$mm) and later coregistered to the functional images.

**fMRI paradigm.** The activation procedure was a block design alternating activation and control conditions. The activation conditions lasted 40 seconds and were followed by 20 seconds rest conditions, during which a black screen was presented.

During the activation phases, emotionally expressive faces were presented in succession in the following order: 10 angry, 10 happy, 10 neutral and 10 fearful faces, with 5 male and 5 females in each category. Each stimulus appeared for 2000ms with a 2000ms interstimulus interval. The entire
procedure lasted 4 minutes and was repeated 4 times. Stimuli were presented to the patient via a video projector, a front-projection screen and a system of mirrors fastened to the head coil. The visual field spanned by this setup was approximately $15 \times 11^\circ$ with the visual stimuli subtending a visual angle of $8.2 \times 5.7^\circ$. The patient was informed of the beginning of each activation phase and asked to keep his eyes open with his gaze straight ahead during these runs. Spatial frequencies of the 4 categories of stimuli were similar (mean ± SD for angry: 11.3 ± 2.9 c/image; fearful: 12.0 ± 2.3 c/image; happy: 11.6 ± 2.6 c/image; neutral: 11.8 ± 2.6 c/image; $F_{3, 36} = 0.12, P = 0.95$).

Similarly, the luminance of the 4 categories of stimuli were comparable (mean ± SD for angry: 24.5 ± 2.5 cd/m$^2$; fear: 25.9 ± 5.3 cd/m$^2$; happy: 25.0 ± 4.5 cd/m$^2$ and neutral: 25.2 ± 3.8 cd/m$^2$; $F_{3, 36} = 0.16, P = 0.92$).

**Data Processing.** Statistical Parametric Mapping SPM99 (http://www.fil.ion.ucl.ac.uk/spm/) was used for image processing and statistical analyses. All functional volumes were spatially realigned to the first image of the first experimental run, and smoothed with an isotropic 6 mm full-width at half-maximum (FWHM) Gaussian kernel. Data series were then submitted to a single-subject fixed-effects analysis using the general linear model. The four conditions of interest (Fear, Happy, Angry, Neutral) of the four runs, were modeled by boxcar waveforms, convolved with a canonical hemodynamic response function, and included in a multiple regression analysis. For all contrasts, a fixed statistical threshold of $P < 0.001$ (uncorrected) was used. SPM parameter estimates were obtained for the activated cluster for each condition.