Supporting Information

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SI Methods

Housing and Care of Subjects. Crows were maintained in individual cages on the University of Washington campus and fed an ad libitum mixture of dry dog food, peanuts, meat, cheese, French fries, bread, fruits, and vegetables. Exposure of birds to people was minimal during captivity (the cages are atop a building only accessed by research staff). Daily, one person, wearing a mask (the caring face) fed the birds and washed their cages. The cages had no bottoms but sat directly on concrete that we cleaned using water pressure sufficient to rinse feces and food scraps out of the cage. During this cleaning, the crows sat calmly on a high perch partially concealed from their keeper by a tarp.

Experimental Exposure to Faces. On the evening before an experiment, a single crow was captured from its holding cage by a person wearing the threatening face, placed in a sock to calm it, and carried across campus to a small wire cage in a fume hood of the imaging laboratory. Water, but no food, was available. We draped a blanket across the front of the cage to prevent the bird from seeing out into the laboratory and to keep it calm as it acclimated overnight without food.

On the day of an experiment, we reached under the blanket draping the experimental cage, removed the crow while covering its eyes with a hood, and injected [F-18]fluorodeoxyglucose (FDG) into the peritoneum. All crows remained passive and relaxed during this procedure with no visible signs of stress or struggle. We returned the crow back into the blanket-draped cage and played recorded crow calls (contact kaws, no alarm calls) for 2 min, after which we started experimental treatments. Each exposure was interspersed with a corresponding 1-min-long break during which time the blanket was replaced on the cage, and the crow was allowed to relax out of view of the stimulus. To expose the crow to the human face, two researchers were in the laboratory. One researcher sat 0.5 m from the cage facing the crow, while the second researcher removed the blanket and kneeled next to the sitting person. Both people wore the same mask and were fully visible to the crow. After the 14 min of the experiment (seven exposures and seven breaks), we again took the crow out of the cage and carried it out of the building, placed it in the PET scanner and injected FDG simultaneously with scan start. A zoom factor of 1.302 and a beta of >0.05 for multiple comparisons (4). The resultant Z-score statistic maps represent the extent and significance of regional brain activity averaged across groups under different stimulation paradigms. Coordinates for which Z values was >3.8 were considered statistically significant, controlling the type I error rate approximately at P = 0.05 for multiple comparisons (4).

PET Scanning Procedure. The crows were anesthetized with 2.5–3.5% isoflurane during the imaging procedure. A special nose cone fabricated from a 50-mL syringe tube was used to accommodate the crow’s beak. The Inveon PET scanner collects data in a list mode format that allows custom timing of the data after it has been acquired. In addition to the emission data, a transmission scan was taken of the crow’s torso to verify the extent and signiﬁcance of regional brain activity averaged across groups under different stimulation paradigms. Coordinates for which Z values was >3.8 were considered statistically significant, controlling the type I error rate approximately at P = 0.05 for multiple comparisons (4). The resultant Z-score maps were superimposed on to the atlas-aligned MRI template for anatomical localization of activated structures. To demonstrate the progressive nature of metabolic alterations relative to average number of blinks per minute (index of attentiveness to perceived threat), a voxel-wise regression analysis was performed, and correlation coefficients were converted to Z values by using the variance map generated in the regression analysis as described (5).

To confirm the findings of the voxel-wise analyses outlined above, stereotactically defined volume-of-interest analysis for structures with a Z score of ≥3.8 were measured and statistically compared by either t test or linear regression using a software program (SPSS; Version 11; SPSS Inc.).


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**Fig. S1.** [F-18]FDG activity during a 2-h-long dynamic scan of a single crow.

**Movie S1.** The 3D reconstruction of [F-18]FDG activity in the brain of an awake crow viewing a threatening person. The movie is the maximum intensity projection (MIP) of the 3D reconstructed image viewed at 30 different view angles. The color lookup table (LUT) for the movie is provided. The yellow and red areas correspond to regions of higher FDG uptake; green is areas of moderate FDG uptake; and blue is regions of low FDG uptake. The image was formed from the 27–37-min emission data.

*Movie S1*