Visualising facial distortions in prosopometamorphopsia

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Lancet 2024; 403: 1176

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A 58-year-old man with a 31-month history of seeing peoples' faces as distorted and, in his words, appearing "demonic" visited our laboratory for assessment. The patient stated that the distortions—severely stretched features of the face, with deep grooves on the forehead, cheeks, and chin—were present on every person's face he encountered, but he reported no distortions when looking at objects, such as houses or cars. The patient said that even though faces were distorted, he was still able to recognise who they were. Notably, he reported no distortions when viewing facial images on a screen or on paper. The distortions were not accompanied by delusional beliefs about the identities of the people he encountered—such as his family or friends.

The patient had a history of bipolar affective disorder and post-traumatic stress disorder. Additionally, he had a significant head injury at the age of 43 years that led to hospitalisation. He also had possible carbon monoxide poisoning at the age of 55 years, which occurred 4 months prior to the onset of his distortion symptoms. He was not prescribed any medications. He reported no use of illicit substances.

On initial assessment, the patient was well and not distressed; he had some mild low back discomfort. The distortions were very distressing to him initially, he said, but he had become habituated to them. Neuropsychological testing indicated no obvious abnormal general cognitive function; Mini-Mental State Examination score was 30/30. He had no deficits of visual acuity (10/10 in both eyes) or colour vision (Ishira plates: 25/25; Farnsworth–Munsell 100-hue test: average discrimination). Computer-based face perception tests indicated mild impairment in recognition of facial identity but normal recognition of facial expression. No laboratory investigations were done at this stage.

Whole-brain T1-weighted and T2-weighted MRI scans showed a round lesion—T1 dark and T2 bright—measuring approximately 1 cm, located on the superior aspect of the head of the left hippocampus, displacing it inferiorly about 3 mm; despite this, the internal anatomy of the left hippocampus was preserved. The impression from the neurologist was that the lesion was probably an arachnoid cyst in the left hippocampal head; other observations included normal ventricle size, unremarkable midline structures, clear paranasal sinuses, and mild cerebral atrophy.

At 1-year follow-up, a repeated MRI showed no change in the size of the cyst.

As the patient reported no distortion when viewing facial images on a screen or on paper, we asked him to compare an in-person face to a photograph of the face taken in the same room under identical lighting conditions. By alternating between observing the in-person face—perceived as distorted—and the photo on a computer screen—perceived as undistorted—he provided real-time feedback on the perceived differences. We then used image-editing software to modify each photo until it matched his in-person perception (figure).

Based on the patient's description of his visual perception, the neuropsychological assessment, and the distortion visualisations, we concluded that he had prosopometamorphopsia.

Prosopometamorphopsia is a rare neurological disorder of visual perception in which faces appear distorted in shape, texture, position, or colour. In most cases, the distortions occur all the time, whether the patient sees the face in person, on a screen, or on paper, thus making it difficult for patients to assess the accuracy of illustrations depicting their perceptual abnormalities because the illustration itself will appear distorted.

Prosopometamorphopsia's aetiology is varied and can occur in the context of head trauma, cerebral infarction, epilepsy, migraine, and hallucinogen-persisting perception disorder. The disorder can also manifest without detectable structural brain changes.

Our patient's unusual phenomenology, combined with computer software, enabled us to generate photorealistic visualisations of the distortions he experienced. Such images, we believe, have not been generated before (video).

See Online for video

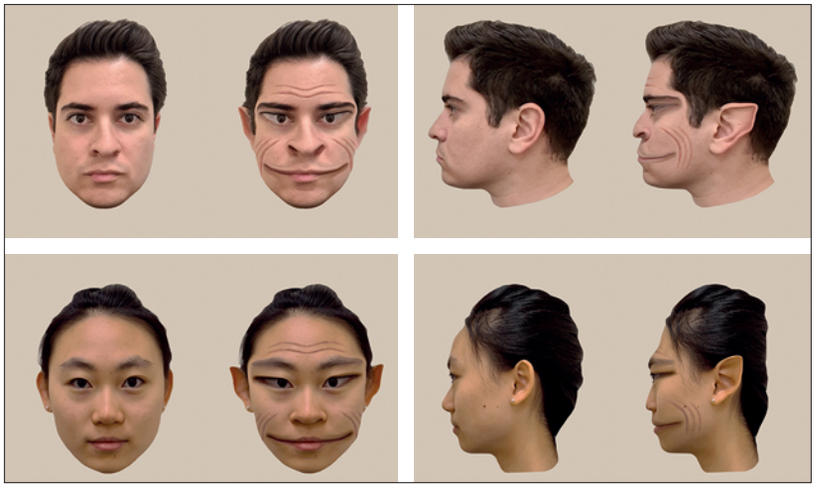

Figure: **Visualising facial distortions in prosopometamorphopsia**
Computer-generated images show distortions perceived by the patient of both a man's (top) and a woman's (bottom) face; each is shown from the front and the right.

Contributors
We all contributed to the patient's assessment. AM and BD wrote the original draft of the manuscript. All authors reviewed and edited the paper. Written consent for publication was obtained from the patient and the people whose images are shown.

Declaration of interests
We declare no competing interests.

Acknowledgments
We thank the Hitchcock Foundation for funding this research.