

Researchers identify parallel mechanism monkeys and humans use to recognize faces

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Researchers at the Yerkes National Primate Research Center, Emory University, have demonstrated for the first time rhesus monkeys and humans share a specific perceptual mechanism, configural perception, for discriminating among the numerous faces they encounter daily. The study, reported in the June 25 online issue of *Current Biology*, provides insight into the evolution of the critical human social skill of facial recognition, which enables us to form relationships and interact appropriately with others.

"Humans and other social primates need to recognize other individuals and to discriminate kin from non-kin, friend from foe and allies from antagonists," said lead researcher Robert R. Hampton of the Yerkes National Primate Research Center and Emory's Department of Psychology. "Our research indicates the ability to perform this skill probably evolved some 30 million or more years ago in an ancestor humans share with rhesus [monkeys](#)."

The remarkable capability humans have to distinguish among thousands of faces stems from our sensitivity to the unique configuration, or layout, of facial features. "Because faces share so many features in common - eyes, nose, mouth, etc. - the simple detection of the collection of these features alone would not permit us to tell many faces apart," Dr. Hampton noted. "It's our ability to perceive small changes in the relations among the features that enables us to distinguish thousands of faces and recognize those we know," he explained.

Hampton and his research team used the Thatcher Effect, a perceptual illusion named for Margaret Thatcher because it was first demonstrated using an image of the former British prime minister, to determine if rhesus monkeys use configural perception to recognize other monkeys. In the study, the researchers presented images of six different monkeys to four 4-year-old rhesus macaque monkeys raised for two to three years in large [social groups](#) at the Yerkes Research Center.

The researchers "thatcherized" the images of faces by positioning the eyes and mouths upside down relative to the rest of each face. The researchers presented monkeys with normal images of each face upside down and right side up until the monkeys were bored and ceased looking at the pictures. The researchers then showed the monkeys the thatcherized faces. In the upright position, the monkeys were surprised by the distorted features and began looking at the pictures again. In contrast, when the faces were upside down, they were not at all surprised and treated the faces as if nothing had been done to them.

This is similar to the human response to the Thatcher Effect, which shows that when the eyes and mouth are rotated and, thus, distorted, humans surprisingly process the upside-down version of the image more as a collection of features and with less emphasis on the relations among the features. As a result, the face appears fairly normal despite being thatcherized. However, when viewed right side up, humans say the image looks awkward or grotesque, demonstrating they clearly see the eyes and mouth have been rotated.

"This study advances our understanding of social processes critical for a healthy and successful social life in primates. Early primates apparently solved the problem of recognizing each others' [faces](#) in this way well before humans arrived on the planet," Dr. Hampton concluded.

For nearly eight decades, the Yerkes National Primate Research Center,

Emory University, has been dedicated to conducting essential basic science and translational research to advance scientific understanding and improve the health and well-being of humans and nonhuman primates. Today, the center, as one of only eight National Institutes of Health-funded national primate research centers, provides leadership, training and resources to foster scientific creativity, collaboration and discoveries. Yerkes-based research is grounded in scientific integrity, expert knowledge, respect for colleagues, and open exchange of ideas and compassionate quality animal care.

Within the fields of microbiology and immunology, neuroscience, psychobiology and sensory-motor systems, the center's research programs are seeking ways to: develop vaccines for infectious and noninfectious diseases, such as AIDS and Alzheimer's disease; treat cocaine addiction; interpret brain activity through imaging; increase understanding of progressive illnesses such as Parkinson's and Alzheimer's; unlock the secrets of memory; determine behavioral effects of hormone replacement therapy; address vision disorders; and advance knowledge about the evolutionary links between biology and behavior.

Source: Emory University ([news](#) : [web](#))

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