Naming may be key to brain's ability to recognize faces

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At first glance, this composite images looks like the actor Brad Pitt. That is because our brain processes faces holistically. But look just at the the eyes in the figure. They are actually the eyes of the actor Matt Damon. (Gauthier Lab)

(PhysOrg.com) -- Our tendency to see people and faces as individuals may explain why we are such experts at recognizing them, new research indicates. This approach can be learned and applied to other objects as well.

"This new research adds to the evidence that the brain processes faces differently because of our expertise with them. It also tells us what it is about our experience with faces that leads us to treat them holistically,"

Isabel Gauthier, associate professor of psychology at Vanderbilt University and one of the study's co-authors, says. "This knowledge may be useful in the development of training protocols for individuals with difficulties in face perception, such as individuals with autism spectrum disorders."

The research is currently in press at *Psychological Science*. Gauthier's co-authors are Alan Wong, who completed the study as his doctoral thesis in psychology at Vanderbilt, and Thomas Palmeri, associate professor of psychology. Wong is now an assistant professor at Chinese University of Hong Kong.

"Our findings suggest that facial expertise does not just develop with any type of experience," Wong says. "Learning to recognize a set of objects as individuals may work, but categorizing them at a more general level, or learning to manipulate them, would not. We develop different types of expertise in recognizing different objects not just due to their unique appearance, but also because of the types of experience we have had with them."

For decades, scientists have debated whether we are better able to recognize faces because we have evolved a brain system dedicated to this task or because we have extensive practice recognizing faces. Researchers agree that we recognize faces holistically, which is not how we generally recognize other objects. For example, we find it almost impossible to attend to only one part of a face and ignore the rest, while we might recognize a car by its grill, taillights or branding.

Prior research has shown that people can develop face-like expertise with novel objects, such as cars, and that once that expertise has been developed those objects are also processed holistically. But up until now it was unclear what it was about expertise that produced this holistic effect.

In the new study, Wong, Gauthier and Palmeri investigated this question by comparing two different types of training regimens with the same novel objects, called Ziggerins. The Ziggerins were created just for the experiment and have no real-world function.

One group learned to individuate these objects with unique names, much like we do with people and faces. Another group learned to very quickly categorize the objects based on shared structure. Each group became better than the other at the task on which it was trained, illustrating that different kinds of perceptual expertise can develop for the same objects. But, only the group that learned to individuate Ziggerins later processed novel Ziggerins holistically, like faces.

"This research indicates that not only is individuation key to our expertise with faces, but that this technique can be quickly applied to other objects," the authors said. "Hallmarks of face-like expertise do not require 10 years, or even 10 hours, of experience to emerge."

Provided by Vanderbilt University (news : web)

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