Sex matters: Why guys recognize cars and women recognize birds best

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Some of the images used in the object recognition test. Credit: Gauthier Lab

(Medical Xpress)—Women are better than men at recognizing living things and men are better than women at recognizing vehicles.

That is the unanticipated result of an analysis Vanderbilt psychologists performed on data from a series of visual recognition tasks collected in the process of developing a new standard test for expertise in object recognition.

"These results aren't definitive, but they are consistent with the following

story," said Gauthier. "Everyone is born with a general ability to recognize objects and the capability to get really good at it. Nearly everyone becomes expert at recognizing faces, because of their importance for social interactions. Most people also develop expertise for recognizing other types of objects due to their jobs, hobbies or interests. Our culture influences which categories we become interested in, which explains the differences between men and women."

The results were published online on Aug. 3 in the *Vision Research* journal in an article titled, "The Vanderbilt Expertise Test Reveals Domain-General and Domain-Specific Sex Effects in Object Recognition."

"Our motivation was to assess the role that expertise plays in object recognition with a new test that includes many different categories, so we weren't looking for this result," said Professor of Psychology Isabel Gauthier. She directs the lab where post-doctoral fellow Rankin McGugin conducted the study.

"This isn't the first time that sex differences have been found in perceptual tasks. For example, previous studies have shown that men have an advantage in mental rotation tasks. In fact, a recent study looking only at car recognition found that men were better than women but attributed this to the male advantage in mental rotation. Our finding that women are better than men at recognizing objects in other categories suggests that this explanation is incorrect."

Discovery of the sex effect in object recognition also casts doubt on several studies that claim an individual's ability to recognize faces is largely independent of his or her ability to recognize objects.

This is an illustration of gender differences in object recognition. Credit: Julie Turner, Vanderbilt University

"Face recognition abilities are exciting to study because they have been found to have a clear genetic basis," said Gauthier, "and many studies conclude that abilities in face recognition are not predicted by abilities in object recognition. But this is usually based on comparing faces to only one object category for men and women."

It took the multi-category analysis to reveal that face recognition abilities are correlated to the ability to recognize different object categories for men and women. For example, men who are better at recognizing vehicles also tend to be better at recognizing faces, while women who are better at recognizing living things tend to be better at recognizing faces.

The researchers modeled their new test after the well-established Cambridge Face Memory Task, which effectively measures a person's ability to recognize faces. After familiarizing themselves with a number of images, participants are shown three images at a time – one from the

study group and two that they haven't seen before – and then are asked to pick out the image that they had studied.

While one goal of the new study was to compare object and face recognition skills, another goal was to develop a better way to measure who has exceptional skills in one domain: how to find the experts in the recognition of cars or birds or even mushrooms. To do this, the Vanderbilt researchers reasoned that performance on any category of interest needed to be compared to performance on many other categories, to ensure that the self-proclaimed bird expert is not only better with birds than most people, but also better with birds than with most other categories. So they designed the new test with eight categories of visually similar objects: leaves, owls, butterflies, wading birds, mushrooms, cars, planes and motorcycles.

To evaluate the new test, they administered it to 227 subjects – 75 male and 82 female – with a mean age of 23. When the results of the entire group were analyzed, the researchers found that increasing the number of categories revealed a large sex difference: Women proved significantly better at recognizing living things while men were better at recognizing vehicles. In addition, the researchers administered a face recognition test to about half of the participants, which allowed them to determine the correlation between vehicle recognition and face recognition in men and the correlation between recognition of living things and faces in women.

More information: dx.doi.org/10.1016/j.visres.2012.07.014

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