

Innate or learned, recognition begins almost at birth

by Scott_LaFee

Within hours of birth, most newborns have begun to imitate the facial expressions of adults. Soon they will start to distinguish between familiar faces and those of strangers. They will gaze longest at their mothers and display a notable preference for attractive people.

These early-in-life abilities are well-documented, yet they raise more questions than they answer. Most centrally: How do newborns know what a face looks like? Is facial recognition hard-wired into their brains? Or is it a skill that must be learned, albeit remarkably quickly?

"One camp (of researchers) argues that it's innate," said Karen Dobkins, a professor of psychology at University of California San Diego. "They cite evidence that shows infants naturally orient to faces, that face-processing in the brain is specialized, unlike any other expertise.

"The other side says it's learned. It's something humans are very good at very quickly because we get a lot of exposure. Faces are important to human communication and survival. These researchers say there's nothing particularly special about how the brain recognizes faces. They say the same process applies to other kinds of visual stimuli."

WOMB WITH A VIEW

The idea that babies enter the world with pre-existing notions of what people look like arises from multiple experiments and observations.

First, there's the astonishing speed with which newborns seem able to recognize another human face, and presumably its significance. Some scientists argue that this indicates a kind of evolved head start, a vital ability to quickly discern friends from foes.

In experiments, newborns given a choice almost invariably peer longest at images of their mother's face compared with those of strangers'.

In 2001, psychologist Paul C. Quinn at Washington and Jefferson College in Pennsylvania published a paper reporting that 3- and 4-month-old infants were able to differentiate between familiar and novel silhouettes of human heads.

Even more astounding, Alan Slater, a psychologist at the University of Exeter in England, found that newborns as young as 1 day old showed a marked predilection for attractive people.

His explanation: Humans are born with an inherent set of visual preferences. Babies prefer high contrast and objects that are curved or top-heavy, such as the letter T. They seem to intrinsically understand the basic geography of a face - two eyes over a mouth - even if they have never seen one before. Attractive faces draw greater interest from newborns, said Slater, because they are more like a prototypical face.

The hard-wired-by-evolution argument is further buttressed, according to its supporters, by functional magnetic resonance imaging (fMRI) studies that show distinct areas of the brain - in particular, a patch of cells behind the right ear called the fusiform gyrus - that seem to specialize in perceiving and recognizing faces.

LEARN BY LOOKING

But other scientists say the research is far from conclusive.

"Finding evidence of a very specialized system in the adult brain is no evidence of innateness," said Isabel Gauthier, a psychologist at Vanderbilt University. "A similar network of brain areas exists that responds to words, and there is no chance that that is innate."

Conversely, she said, there is "lots of evidence" indicating that telling apart objects that are visually similar, such as faces, is a skill that can be learned.

"We are pretty good at recognizing faces (although not that great if the faces are unfamiliar, as in the case of security videotapes), and there is clear evidence that learning is involved because we are better at recognizing faces of a race we are familiar with," she said.

Moreover, Gauthier points to other fMRI studies that show fusiform gyrus cells becoming active when a person looks at something else they are familiar with, such as a car or a bird. The neural basis for face recognition isn't unique, she said. The same strategy and cells seem also to be employed, in varying degrees, to identify nonface objects.

Perhaps the only thing both sides currently agree upon is that more research and answers are needed.

"My view is that this is an important question, but that we have almost no relevant data that speaks to it," said Nancy Kanwisher, a professor of cognitive neuroscience at the Massachusetts Institute of Technology.

"Therefore, any expressed opinions on this topic are largely speculation."

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