NEWS

People subconsciously process emotions early in life

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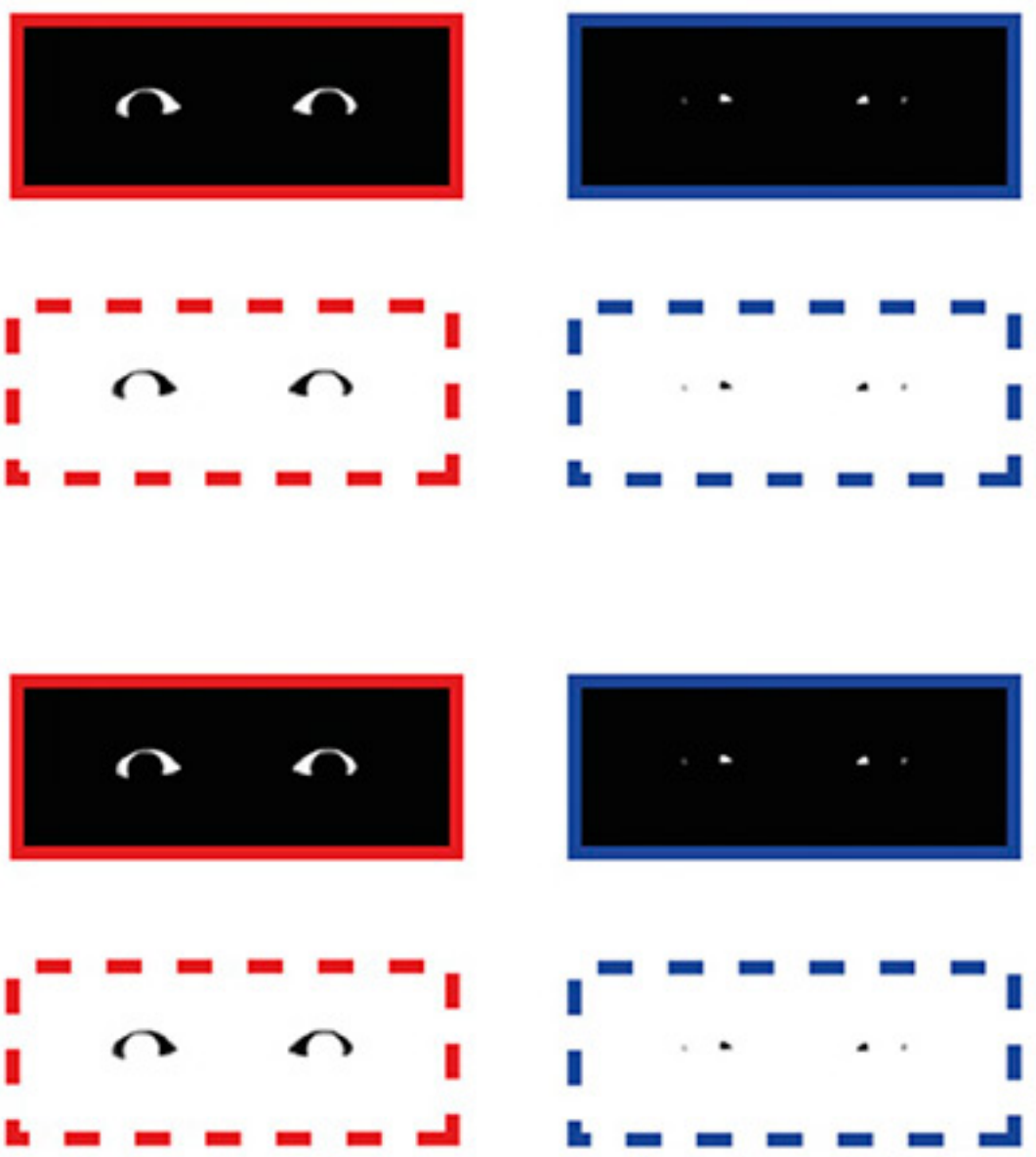

Social vision: Brain activity in babies looks different when they are looking at pictures of eyes expressing fear (left) than at eyes expressing happiness.

By 7 months of age, babies can subconsciously discriminate between happy and fearful emotions by looking only at the eyes of another person, suggest results presented 15 November at the **2014 Society for Neuroscience annual meeting** in Washington, D.C.

The eyes provide clues to a person's emotional state, and thus play an important role in social interactions. Adults can process the emotions contained in others' eyes even if they do not perceive them consciously[1]. The new study investigated whether the same is true in infants.

Most infants naturally show increasing interest in other people's eyes during their first year of life, but children with autism **begin to deviate from this trajectory** at around 2 months of age. They also have **trouble reading emotions**, something typically developing infants learn to do by 7 months of age[2].

In the new study, researchers tested the ability of 7-month-old babies to discriminate between happy and fearful emotions. The researchers used electroencephalography (EEG) to record brain activity while the babies viewed a screen showing pictures of only the eye region of a person's face. The images flashed on the screen for only 50 milliseconds — too short for them to consciously register what they'd seen.

The images, which were rendered in black and white, were captured from the face of a person expressing fear, which causes the eyes to open wider than usual, or happiness, which causes the eyes to narrow.

As a control, the researchers used the same eye images, but inverted the colors so that the regions that were originally black were changed to white and vice versa.

"They don't see these as eyes," says **Sarah Jessen**, a postdoctoral fellow in **Tobias Grossmann**'s lab at the Max Planck Institute in Leipzig, Germany, who presented the work. That ensures that any differences in brain activity triggered by the two emotions are due to the shapes of the eyes, and not to differences in the relative amounts of black and white present in the pictures.

The picture of the fearful eyes triggered a larger response in the occipital region of the brain — a hub for the processing of visual information located at the back of the head — than did the image of

the happy eyes. The effect occurred within 150 milliseconds of seeing the images. That suggests that infants discriminate between emotions during the earliest stages of visual processing, Jessen says.

At later time points, between 300 and 800 milliseconds after seeing the images, the infants showed a greater activation in the brain's frontal region, which is linked to cognitive processing, after seeing the happy eyes than after the fearful eyes. "They seem to allocate more attention to the non-fearful eyes compared to the fearful eyes," Jessen says.

The children showed no changes in brain activity when they viewed the inverted images. That suggests that the responses are specific for the eyes, Jessen says.

The findings were published 27 October in the *Proceedings of the National Academy of Sciences*[3].

For more reports from the 2014 Society for Neuroscience annual meeting, please ***click here****.*

References:

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2. Gelskov S.V. and S. Kouider *Cognition* **114**, 285-292 (2010) **PubMed**

3. Jessen S. and T. Grossmann *Proc. Natl. Acad. Sci. USA* **111**, 16208-16213 (2014) **PubMed**