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Twin study indicates genetic basis for processing faces, places

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A new study of twins indicates that the genetic foundation for the brain's ability to recognize faces and places is much stronger than for other objects, such as words. The results, which appear in the December 19 issue of the *Journal of Neuroscience*, are some of the first evidence demonstrating the role of genetics in assigning these functions to specific regions of the brain.

"We are social animals who have specialized circuitry for faces and places," says Arthur W. Toga, PhD, director of the Laboratory of NeuroImaging at UCLA School of Medicine. "Some people are better at recognizing faces and places, and this study provides evidence that it is partially determined by genetics."

Using a functional magnetic resonance imaging (fMRI) scanner, Thad Polk, PhD, Joonkoo Park, and Mason Smith of the University of Michigan, along with Denise Park, PhD, at the University of Illinois at Urbana-Champaign, measured activity in the visual cortex of 24 sets of fraternal and identical twins. The twins watched several series of images: sets of people's faces, houses, letters strung together, and chairs, as well as scrambled images that served as a baseline measurement.

Previous research had identified distinct regions in the visual cortex where different categories of information are processed, a sort of division of labor in the brain that handles information about people, for example, independently of that related to cars.

Polk's analysis of brain activity patterns from the twins suggests how the organization of these independent regions is shaped. By showing greater similarity in the brain activity of identical twins than their fraternal counterparts when processing faces and places, the results indicate a genetic basis for these functions. Activity in response to words, Polk suggests, may be shaped to a greater degree by one's experiences and environment.

"Face and place recognition are older than reading on an evolutionary scale, they are shared with other species, and they provide a clearer adaptive advantage," says Polk. "It is therefore plausible that genetics would shape the cortical response to faces and places, but not orthographic stimuli."

Source: Society for Neuroscience

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