

Scientists offer explanation for 'face blindness'

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For the first time, scientists have been able to map the disruption in neural circuitry of people suffering from congenital prosopagnosia, sometimes known as face blindness, and have been able to offer a biological explanation for this intriguing disorder.

Currently thought to affect roughly two percent of the population, congenital prosopagnosia manifests as the lifelong failure to recognize faces in the absence of obvious neurological damage, and in individuals with intact vision and intelligence.

Studying subjects aged 33 to 72 using diffusion tensor imaging and tractography, the team of scientists from Carnegie Mellon University, Kings College in London and Ben-Gurion University in Israel were able to show that, unlike that of normal brains, there was a reduction in the integrity of the white matter tracts in the brains of individuals with congenital prosopagnosia. Moreover, the extent of the reduced white matter circuitry was related to the severity of the behavioral impairment.

The results are reported in the Nov. 23 online issue of *Nature Neuroscience*.

White matter is one of the three main solid components of the central nervous system. The white matter is the tissue through which messages pass between different areas of grey matter within the nervous system. People with congenital prosopagnosia are not able to recognize faces, while the ability to recognize other objects may be relatively intact.

This discovery of reduced white matter circuitry could also lead to further understanding of other neurodevelopment disorders, such as developmental dyslexia, in which the same underlying neural alterations might be present. The findings are also important as congenital prosopagnosia is, in many cases, inherited and so studies of this sort can help us understand the relationship between genetics and cortical development.

So far, few successful therapies have been developed for affected people, although individuals often learn to use feature-by-feature recognition strategies or secondary clues such as hair color, body shape and voice. Because the face seems to function as an important identifying feature in memory, it can also be difficult for people with this condition to keep track of information about people, and socialize normally with others.

"This disorder is also of great interest in helping us understand how and under what conditions the brain is or is not 'plastic' as these individuals appear not to be able to compensate for their inability to recognize faces even though they have had ample opportunity to do so over the course of development," said Marlene Behrmann, a professor of psychology at Carnegie Mellon.

Behrmann said the team was excited by the possibility that the failure to propagate signals between different regions of the brain might provide a biological explanation for this perplexing disorder.

Source: Carnegie Mellon University

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