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Unraveling the roots of dyslexia

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By peering into the brains of people with dyslexia compared to normal readers, a study published online on March 12th in *Current Biology*, a Cell Press publication, has shed new light on the roots of the learning disability, which affects four to ten percent of the population. The findings support the notion that the reading and spelling deficit—characterized by an inability to break words down into the separate sounds that comprise them—stems in part from a failure to properly integrate letters with their speech sounds.

"The adults with dyslexia in the study had enough reading experience to match letters and their speech sounds correctly," said Vera Blau of the University of Maastricht, The Netherlands "Still, the results show that the way their brain integrates letters and speech sounds is very different from normal readers. It's quite astonishing."

The researchers examined activity in the brains of dyslexic and normal adult readers by using functional magnetic resonance imaging (fMRI) as they were presented with letters, speech sounds, or a matching or non-matching combination of the two. While undergoing that task, dyslexic adults showed lower activation of a brain region known as the superior temporal cortex than the more typical readers did.

The findings point to a neural deficit in letter-speech sound integration as a fundamental mechanism that might distinguish poor from good readers, Blau said. Such a difficulty in integrating the most basic units of written and spoken language could offer a promising link between well-documented difficulties in processing the sounds of language

(phonology) and the actual reading problem itself, she added.

Her team, led by Leo Blomert at the University of Maastricht, is currently conducting further studies in children as they are learning to read to help identify whether the difficulty to integrate letters with speech sounds begins in early school years and whether it comes before or after deficits in processing the sounds of language.

In addition to enhancing scientists' fundamental understanding of the disability, the new results might also have some ultimate implications for therapy.
"Our findings may offer a way to validate intervention strategies and narrow down the best training approaches," Blau said. Indeed, in a new series of studies, the group is investigating whether training strategies focused on phonological skills as well as letter-sound associations improve reading skills by changing activity levels in the brain of dyslexic readers.

Source: Cell Press (news : web)