

Listen up: Abnormality in auditory processing underlies dyslexia

December 21 2011

People with dyslexia often struggle with the ability to accurately decode and identify what they read. Although disrupted processing of speech sounds has been implicated in the underlying pathology of dyslexia, the basis of this disruption and how it interferes with reading comprehension has not been fully explained. Now, new research published by Cell Press in the December 22 issue of the journal *Neuron* finds that a specific abnormality in the processing of auditory signals accounts for the main symptoms of dyslexia.

"It is widely agreed that for a majority of dyslexic children, the main cause is related to a deficit in the processing of [speech sounds](#)," explains senior study author, Dr. Anne-Lise Giraud and Franck Ramus from the Ecole Normale Supérieure in Paris, France. "It is also well established that there are three main symptoms of this deficit: difficulty paying attention to individual speech sounds, a limited ability to repeat a list of pseudowords or numbers, and a slow performance when asked to name a series of pictures, colors, or numbers as quickly as possible. However, the underlying basis of these symptoms has not been elucidated."

Dr. Giraud and colleagues examined whether an abnormality in the early steps of auditory processing in the brain, called "sampling," is linked with [dyslexia](#) by focusing on the idea that an anomaly in the initial processing of phonemes, the smallest units of sound that can be used to make a word, might have a direct impact on the processing of speech.

The researchers found that typical brain processing of auditory rhythms

associated with phonemes was disrupted in the left [auditory cortex](#) of dyslexics and that this deficit correlated with measures of speech sound processing. Further, dyslexics exhibited an enhanced response to high-frequency rhythms that indirectly interfered with verbal memory. It is possible that this "oversampling" might result in a distortion of the representation of speech sounds.

"Our results suggest that the left auditory cortex of dyslexic people may be less responsive to modulations at very specific frequencies that are optimal for analysis of speech sounds and overly responsive to higher frequencies, which is potentially detrimental to their verbal short-term memory abilities," concludes Dr. Giraud. "Taken together, our data suggest that the auditory cortex of dyslexic individuals is less fine-tuned to the specific needs of speech processing."

Provided by Cell Press

Citation: Listen up: Abnormality in auditory processing underlies dyslexia (2011, December 21) retrieved 1 May 2024 from

<https://medicalxpress.com/news/2011-12-abnormality-auditory-underlies-dyslexia.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--