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"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

"Listen up: Abnormality in auditory processing underlies dyslexia." December 21st, 2011.
<http://medicalxpress.com/news/2011-12-abnormality-auditory-underlies-dyslexia.html>

