

May 14, 2019 Tuesday 9 Iyyar 5779

11:50 IST



Select Language ▼

THE JERUSALEM POST



The national library of Israel on the Givat Ram campus, the Hebrew University of Jerusalem..(Photo by: Courtesy)

Hebrew U. researchers gain insight into brain mechanisms underlying dyslexia

By JUDY SIEGEL-ITZKOVICH
01/25/2017

Dyslexia is believed to affect one in every 10 to 20 people, harming their ability to read and spell words, but not affecting their general intelligence.

The common learning difficulty of dyslexia may be diagnosed, and treatment offered at an early stage, as the result of a new discovery at the Hebrew University of Jerusalem.

Humans have a type of long-term memory (called “implicit memory”) in which we respond less to stimuli as they are repeated over time (called “adaptation”). Now, Jerusalem researchers reveal that dyslexics recover faster than non-dyslexics from their responses to stimuli, such as sounds and written words, leading to their perceptual and reading difficulties.

Dyslexia is believed to affect one in every 10 to 20 people, harming their ability to read and spell words, but not affecting their general intelligence. In a new study published in the peer-reviewed journal eLife, Prof. Merav Ahissar of the psychology department and the Edmond & Lily Safra Center for Brain Sciences and her team carried out a number of experiments with dyslexics and non-dyslexics, to shine new light on the brain mechanisms underlying this condition.

“While dyslexics are diagnosed mainly according to their reading difficulty, they also differ from non-dyslexics in performing simple perceptual tasks, such as tone-frequency discrimination,” said first author Sagi Jaffe-Dax.

Ahissar explained: “Our lab previously found that this is due to ‘poor anchoring,’ where dyslexics have an inefficient integration of information from recent stimuli, collected as implicit memory. This memory typically forms ‘anchors’ that provide specific predictions that perceptually clarify noisy stimuli, and we wanted to see why this is not the case in dyslexics.”

In the current study, the team gave 60 native Hebrew speakers, including 30 dyslexics and 30 non-dyslexics, frequency discrimination and oral reading tasks. During the frequency discrimination task, participants were asked to compare two tones in each trial. All participants' responses were affected – or biased – by implicit memory of previous stimuli. Both groups were affected in similar ways by very recent stimuli, but dyslexics were less affected by earlier stimuli.

“This suggests that implicit memory decays faster among dyslexics,” said Jaffe-Dax. “We decided to test this hypothesis by increasing the length of time between consecutive stimuli and measuring how it affects behavioral biases and neural responses from the auditory cortex, a section of the brain that processes sound. Participants with dyslexia showed a faster decay of implicit memory on both measures. This also affected their oral reading rate, which decreased faster as a result of the time interval between reading the same non-word – a group of letters that looks or sounds like a word – numerous times.”

The team concluded that dyslexics' faster recovery from stimuli can account for their longer reading times, as it causes less reliable predictions for both simple and complex stimuli.

Coauthor Orr Frenkel said: “The formation of adequate predictions is crucial for becoming an expert in general, and an expert reader in particular.

Achieving this depends on matching printed words with predictions based on previous encounters with related words. These predictions are less accurate in dyslexics.”



Print



Print

JPost.com: [Arab-Israeli Conflict](#) | [Israel News](#) | [Diaspora](#) | [Middle East](#) | [Opinion](#) | [Premium](#) | [Blogs](#) | [Not Just News](#) | [Edition Francaise](#) | [Green Israel](#)

[About Us](#) | [Advertise with Us](#) | [Subscribe](#) | [RSS](#)

Copyright © 2014 Jpost Inc. All rights reserved •
[Terms of Use](#) • [Privacy Policy](#)