Dyslexia More Complicated for Chinese
Study uncovers combination of phonological and visuospatial deficits

Dyslexia is different, and perhaps more complicated and severe, in Chinese-speaking people than in those who speak English, a new study contends.

University of Hong Kong researchers say the differences can be seen in brain scans and in the performance of visual and language tasks.

In people who speak English, dyslexia is a phonological disorder. This means they have difficulty detecting or manipulating the sound structure of oral language, which causes problems in mapping speech sounds into letters. Dyslexia in those who speak Chinese, though, is a phonological disorder as well as a visuospatial deficit, the study found.

"In English, the alphabetic letters that form visual words are pronounceable, so access to the pronunciation of English words is made possible by using letter-to-sound conversion rules," study author Wai Ting Siok said in a news release from Cell Press, which published the findings in the Oct. 12 issue of Current Biology.

"Written Chinese maps graphic forms -- i.e., characters -- into meanings; Chinese characters possess a number of intricate strokes packed into a square configuration, and their pronunciation must be memorized by rote," Siok explained. "This characteristic suggests that a fine-grained visuospatial analysis must be performed by the visual system in order to activate the characters' phonological and semantic information. Consequently, disordered phonological processing may commonly coexist with abnormal visuospatial processing in Chinese dyslexia."
Brain scans of normal and dyslexic Chinese readers revealed that dyslexics had weaker activation in a portion of the brain known to be involved in visuospatial processing, the study said. In addition, tests revealed that most people with dyslexia also had a phonological processing disorder.

The researchers said their study was the first to demonstrate the coexistence of visuospatial and phonological disorders in dyslexics, a finding that challenges current theories to explain developmental dyslexia.

"Our results strongly indicate the need for a unifying theory of sufficient scope to accommodate the full complexity of the observed dysfunctions and interactions of the brain systems underlying reading impairments," researcher Li Hai Tan said in the news release.

**More information**

The U.S. National Institute of Neurological Disorders and Stroke has more about dyslexia.

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