

# Dyslexia varies across language barriers

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Chinese-speaking children with dyslexia have a disorder that is distinctly different, and perhaps more complicated and severe, than that of English speakers. Those differences can be seen in the brain and in the performance of Chinese children on visual and oral language tasks, reveals a report published online on October 12th in *Current Biology*, a Cell Press publication.

English [dyslexia](#) consists of a "phonological disorder," meaning that people with the condition have trouble detecting or manipulating the sound structure of oral [language](#), which in turn leads to problems in mapping speech sounds onto letters, explained Wai Ting Siok of the University of Hong Kong. In contrast, the new findings show that developmental dyslexia in Chinese is really two disorders: a visuospatial deficit and a phonological disorder combined.

Siok and her colleague Li Hai Tan say the difference can be traced to the characteristics of the two languages. "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," Siok said. "Written Chinese maps graphic forms—i.e., characters—onto meanings; Chinese characters possess a number of intricate strokes packed into a square configuration, and their pronunciations must be memorized by rote. 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."

The researchers asked normal and dyslexic Chinese readers to judge the physical size of visual stimuli and found that normal readers performed significantly better than dyslexic readers. [Brain scans](#) showed that, compared with normal readers, dyslexics exhibited weaker activation in a portion of the brain known to mediate visuospatial processing. Crucially, Siok said, most Chinese dyslexics with the visuospatial problem also exhibited a phonological processing disorder, as demonstrated by their poor performance in a phonology-related rhyme judgment task, suggesting the coexistence of two disorders.

"Our study for the first time demonstrates the coexistence of visuospatial and phonological disorders in dyslexics," which presents a challenge to current theories to explain developmental dyslexia, Tan said. "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."

Source: Cell Press ([news](#) : [web](#))

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