DENVER - A NEW set of brain images shows that reading English-style alphabet and Chinese characters uses very different parts of the brain.

The results also suggest that Chinese children with reading problems misfire in a different brain region than the one used in reading alphabet-based languages like English. This demonstrates that the learning disorder dyslexia is not the same in every culture and does not have a universal biological cause, researchers said.

Neurologists described the results as 'very important and innovative'. While dyslexia has certain common roots, researchers said they now have some proof that it plays out differently according to the demands Western and Eastern languages place on the brain's wiring and processing centres.

And, it suggests that treating dyslexia probably will require different therapies between nations and languages as well, they said.

'We should not be alphabet-centric in our thinking,' said Georgetown University neuroscientist Guinevere Eden. She has conducted brain scans on American dyslexic children but did not participate in the study on Chinese students.

'Doing is complex,' she said. 'This shows we need to be more open-minded about diverse treatment approaches.'

Dyslexia is a common developmental disorder in which people of normal intelligence have difficulty learning to read, spell and master other language skills.

In the United States, it is observed in 5 to 15 per cent of the population; in China, it affects up to 7 per cent of the population.

Its origins are complex.

There appears to be an inherited genetic aspect. It also may result from neural injury before birth that changes visual and auditory pathways in the brain.

Earlier brain scans show that English-reading dyslexics misfire in the left temporal-parietal region of the brain linked to awareness of phonemes, 44 sounds from the English alphabet. It is located in the middle and upper portions of the brain's left lobe. Similar results were found with French and Italian dyslexics.
But reading Chinese, according to the new study, uses a different part of the brain called the left middle frontal gyrus (LMFG).

Brain scans show the LMFG fires in normal Chinese readers, but Chinese dyslexics show glitches in that circuitry, according to Dr Tan Li-Hai of the National Institute of Mental Health in Bethesda and the University of Hong Kong.

The LMFG is located towards the left-front of the brain. It's associated with symbol interpretation. Unlike alphabet letters, Chinese characters represent entire thoughts and objects.

Dr Tan's results appear in the latest issue of the journal Nature.

In the experiment, the researchers worked with 16 Beijing schoolchildren who were 10-12 years old. Eight were dyslexic and the rest were normal readers.

It does not mean Chinese dyslexics might be able to use different portions of their brain and learn to read English more easily. Once a person learns to read they tend to use the same circuitry regardless of the second language and its alphabet, Prof Eden said. -- AP