

Title: Developmental dyslexia without dysgraphia in Chinese: a case study

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Abstract

*Introduction*

Previous studies on stroke patients have documented double dissociations of individuals' reading and writing abilities. That means it is possible for individuals to suffer from dysgraphia, partial or entire loss of premorbid normal writing abilities, without dyslexia, partial or entire loss of premorbid normal reading abilities, and the other way round. Within the literature of developmental studies, however, it is uncommon to have dissociated reading and writing problems. Particularly, the strong associations between reading and writing in Chinese has prompted researchers to believe that reading and writing development maybe interdependent on each other (e.g. Tan, Spinks, Eden, Perfetti, & Siok, 2005). The current study reported a Chinese school-aged boy with dyslexia problem but intact writing abilities, which would shed some lights on the theories that explain development of reading and writing abilities in Chinese.

*Method*

Participants. LSX is a 9.78 year-old boy born in Shenzhen and received mainstream education in Shenzhen starting from age 3. He was identified by school teachers to have literacy problems. No significant visual and hearing impairments were reported.

A total of 50 children (mean age = 9;89, gender balanced) studying in in three different mainstream schools in Shenzhen were recruited. All students were reported by their school teachers to have no significant speech/language, visual, hearing or academic problems.

Tasks. All participants were tested with a bunch of assessments including a non-verbal intelligence test, a Chinese character reading test, a Chinese writing-to-dictation test, a rapid automatized naming test, a morphological awareness test, a phonological awareness test, and a Chinese character delayed copying test.

### *Results and Discussion*

Results showed that LSX demonstrated significantly lower accuracies in naming Chinese characters and lower accuracies in the morphological awareness task compared to the normal subjects ( $p < .01$ ). He demonstrated comparable performance with the normal subjects in the non-verbal intelligence test, the writing-to-dictation test and the two phonological tests. In each trial of the delayed copying test, each participant was instructed to copy a target pseudo-character on an Android tablet three seconds after the brief presentation (two seconds) of the target. Results showed that the normal participants use logographemes and radicals as the functional writing units in the delayed copying as reflected in the longer elapsed time spent on the logographeme- and radical-boundaries in copying the Chinese characters. Such pattern was not observed in LSX's writing. We claim that LSX's reading difficulties is a results of inadequate knowledge of sub-character units, such as radicals and logographemes, in Chinese. His performance also suggest that training on writing abilities may not improve individuals' reading abilities in Chinese.

### Reference

Tan, L. H., Spinks, J. A., Eden, G. F., Perfetti, C. A., & Siok, W. T. (2005). Reading depends on writing, in Chinese. *Proceedings of the National Academy of Sciences of the United States of America*, 102(24), 8781-8785.