

**ZMATH 2016e.00565**

**Yang, Xiujie; Meng, Xiangzhi**

**Dissociation between exact and approximate addition in developmental dyslexia.**

Res. Dev. Disabil. 56, 139-152 (2016).

Summary: Previous research has suggested that number sense and language are involved in number representation and calculation, in which number sense supports approximate arithmetic, and language permits exact enumeration and calculation. Meanwhile, individuals with dyslexia have a core deficit in phonological processing. Based on these findings, we thus hypothesized that children with dyslexia may exhibit exact calculation impairment while doing mental arithmetic. The reaction time and accuracy while doing exact and approximate addition with symbolic Arabic digits and non-symbolic visual arrays of dots were compared between typically developing children and children with dyslexia. Reaction time analyses did not reveal any differences across two groups of children, the accuracies, interestingly, revealed a distinction of approximation and exact addition across two groups of children. Specifically, two groups of children had no differences in approximation. Children with dyslexia, however, had significantly lower accuracy in exact addition in both symbolic and non-symbolic tasks than that of typically developing children. Moreover, linguistic performances were selectively associated with exact calculation across individuals. These results suggested that children with dyslexia have a mental arithmetic deficit specifically in the realm of exact calculation, while their approximation ability is relatively intact.

*Classification:* F30 F20 C50 C40 C30

*Keywords:* dyslexia; exact calculation; approximation; phonological processing; number sense

doi:10.1016/j.ridd.2016.05.018