

ZMATH 2014f.00506

Wang, Yunqi; Geng, Fengji; Hu, Yuzheng; Du, Fenglei; Chen, Feiyan

Numerical processing efficiency improved in experienced mental abacus children.

Cognition 127, No. 2, 149-158 (2013).

Summary: Experienced mental abacus (MA) users are able to perform mental arithmetic calculations with unusual speed and accuracy. However, it remains unclear whether their extraordinary gains in mental arithmetic ability are accompanied by an improvement in numerical processing efficiency. To address this question, the present study, using a numerical Stroop paradigm, examined the numerical processing efficiency of experienced MA children, MA beginners and their respective peers. The results showed that experienced MA children were less influenced than their peers by physical size information when intentionally processing numerical magnitude information, but they were more influenced than their peers by numerical magnitude information when intentionally processing physical size information. By contrast, MA beginners and peers showed no differences in the reciprocal influences between the two conflicting dimensions. These findings indicate that substantial gains in numerical processing efficiency could be achieved through long-term intensive MA training. Implications for numerical magnitude representations and for training students with mathematical learning disabilities are discussed.

Classification: F30 C30

Keywords: numerical processing efficiency; mental abacus; numerical stroop paradigm; congruity effect; interference; facilitation

doi:10.1016/j.cognition.2012.12.004