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# **Numerical magnitude processing in abacus-trained children with superior mathematical ability: an EEG study**

**Key words: EEG, Abacus training, Distance effect, Numerical magnitude processing, Child**

# ***Research Summary***

**The present study investigated the neural substrates of numerical processing in children with AMC training compared to their peers by adopting the numerical comparing tasks in different notations (digit and dot), and observed that:**

- The abacus-trained group had superior mathematical abilities than their peers;
- Distance effects (DEs) were found both in behavioral results and on EEG waveforms;
- The DE size on the amplitude of the late negative-going component was different between groups in the digit task (Fig. 2);
- Both the behavioral and EEG DEs were modulated by the notation.

# ***Innovation points***

The present study

- **Revealed** that the neural substrates of magnitude processing were modified by AMC training.
- **Suggested** that the mechanism of the representation of numerical magnitude for children with superior mathematical abilities was different from their peers.
- Also **provide** evidence for a view of non-abstract numerical representation.