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**Enhancing arithmetic in pre-schoolers with comparison or number line estimation training: does it matter?**

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Summary: Children's intuitive understanding of number, i.e. number sense, is associated with individual differences in mathematics achievement. To investigate the causal association between number sense, traditionally assessed with comparison or number line estimation tasks, and mathematics achievement, often assessed with an arithmetic test, an intervention study was conducted that aimed at training either comparison or number line estimation skills. We contrasted a comparison and number line estimation training. By doing so, we wanted to address the question which intervention had the largest effect on arithmetic. In addition, such a direct comparison between comparison and number line estimation trainings would allow us to get more insight in the association between both tasks. Participants were 151 five-year-olds that were randomly allocated to either an experimental condition (i.e. comparison or number line estimation) or one of the two control conditions (i.e., active control condition and empty control condition) in a pretest-posttest design measuring number knowledge, (non-)symbolic comparison and number line estimation and arithmetic. The results showed that both comparison and number line estimation trainings had a positive effect on arithmetic. However, the absence of transfer effects from one task to another, also suggested that comparison and number line estimation rely on different mechanisms and probably influence arithmetic through different mechanisms.

*Classification:* F21 F31 D31

*Keywords:* magnitude processing training; numerical intervention; arithmetic achievement

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