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The cognitive foundations of early arithmetic skills: it is counting and number judgment, but not finger gnosis, that count.

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Summary: Following on from ideas developed by Gerstmann, a body of work has suggested that impairments in finger gnosis may be causally related to children's difficulties in learning arithmetic. We report a study with a large sample of typically developing children ($N = 197$) in which we assessed finger gnosis and arithmetic along with a range of other relevant cognitive predictors of arithmetic skills (vocabulary, counting, and symbolic and nonsymbolic magnitude judgments). Contrary to some earlier claims, we found no meaningful association between finger gnosis and arithmetic skills. Counting and symbolic magnitude comparison were, however, powerful predictors of arithmetic skills, replicating a number of earlier findings. Our findings seriously question theories that posit either a simple association or a causal connection between finger gnosis and the development of arithmetic skills.

Classification: F32 C32 C42

Keywords: arithmetic development; numerical cognition; finger gnosis; symbolic and nonsymbolic magnitude judgment; counting; children
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