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The effect of inhibitory control on general mathematics achievement and fraction comparison in middle school children.

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Summary: Individual differences in inhibitory control have been shown to relate to general mathematics achievement, but whether this relation varies for specific areas within mathematics is a question that remains open. Here, we evaluate if inhibitory processes play a specific role in the particular case of fraction comparison, where learners must ignore the potentially misleading information provided by the natural numbers composing fractions (e.g. $2/3 > 4/7$ despite $2 < 4$ and $3 < 7$). To do this, we presented a sample of Chilean children ($N = 450$) from 5th, 6th, and 7th grade with a numerical comparison task tapping inhibitory and other processes. Results showed that both general math achievement and accuracy in comparing fractions were significantly predicted by inhibition. The former association, however, turned out to mediate the latter one. Another process, related to visual priming, predicted children's likelihood to answer fraction comparison items focusing exclusively on the fraction components. This relation was, furthermore, not mediated by general math achievement. Altogether, these findings shed light on the mental processes underlying the early stages of the learning of fractions.

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