

**Anxiety and math skills which relations?
A longitudinal study in the third year of primary school**

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Many scientific studies have shown that anxiety affects performance in mathematics [1]. It is still unclear, anyway, whether and how these two factors influence each other in the early years of schooling [2].

The present study aims at evaluate, in a group of children attending the 3rd year of primary school, if anxiety (both in its general and specific components) can predict mathematic performance between the beginning and the end of the school year. We expect that the children could provided an evaluation of their math and general anxiety very similar to the one proposed by the teacher and that the combination of specific and that general anxiety could negatively correlate with proficiency in mathematics.

98 primary school children (63 females) aged between 8 and 9 years (M 8 years and 7 months) were assessed with a battery of tests at the beginning and at the end of the same school year. The assessment included tools to evaluate: general anxiety, math anxiety, intelligence, math fluency, short-term and working memory and mathematical learning at the beginning and end of the third year of primary school. In addition, the general anxiety was assessed by the teacher.

To analyze how cognitive and emotional factors predict math performance a hierarchical linear regression was used. MAT-III was the dependent variable and we run the analysis using the following hierarchy of regressors: the first block (intelligence) explains the 13% of mathematical learning variance $R^2 = .13$, $F(1,97) = 7.058$, $p = .001$; the second block (memory) adds another 16%, $\Delta R^2 = .16$, $F \text{ change} = 2.8$, $p = .011$. The third block (processing speed) ($p > .05$) do not It increases a significant proportion of explained variance. Block four (assessed anxiety by children) is significant and explains a quote of variance greater than 7% $\Delta R^2 = .07$, $F \text{ change} = 4.3$, $p = .016$. Adding the TAD in block 5 (anxiety evaluated teacher's) increase the explained variance of 4%, $\Delta R^2 = .04$, $F \text{ change} = 5.5$, $p = .022$.

The children in the third year of primary school are capable to assess their own level of anxiety. This study confirms how emotional factors could have detrimental effects on learning in mathematics. In light of these data, we want to underline that not only cognitive aspects, but also emotional ones, could be monitored during the school years as a possible source of math low performance.

1. Hambree R. (1990). The nature, effects, and relief on mathematics anxiety. *Journal of Research in Mathematics Education*, 21: 33-46.

2. Cargnelutti E, Tomasetto C, & Passolunghi M.C. (2016). How is anxiety related to math performance in young students? A longitudinal study of Grade 2 to Grade 3 children. *Cognition and Emotion* 3:1-10.