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COMBINED COGNITIVE ENRICHMENT PROGRAMS OF NUMERICAL AND VISUAL-SPATIAL ABILITIES AS A PRIMARY PREVENTION METHOD FOR LEARNING DIFFICULTIES IN MATHEMATICS: AN EXPLORATIVE STUDY.

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Introduction

A body of research shows the significant role of visual-spatial skills in the development of mathematical abilities.

Objectives and aims

Current research aimed at studying the effect of training for the visuo-spatial and numerical skills enrichment in 5 and 7-year-old children.

Methods

Forty-four 5-year-old children and 52 second graders were recruited in two Italian schools. Each age group was divided, respectively, into a control group (i.e., carried out the planned curricular activities) and an experimental group (completed combined enrichment programs for 3 months).

Participants were evaluated at pre and post-test by standardised assessments, designed to evaluate numerical and visuo-spatial skills. Participants were distinguished in two levels of numerical abilities (high / low). By means of factorial analyses of variance, we compared the results in pre and post conditions; multiple linear regressions identified predictors of mathematic achievements at post-test.

Results

The significant effectiveness of training was found: at post-test, children from the experiment improved in terms of visuo-spatial and mathematical competences. Furthermore, the impact of the combined visuo-spatial and numerical training ? assessed in terms of achievements — was more evident in children with low numerical abilities.

Conclusions

Current outcomes suggest that the combined visuo-spatial and numerical enrichment training proposed to our participants seems to partially bridge the gap between subjects with initial low and high numeracy competences. Therefore, the synergy of the treatments would be worthy of attention to attain a primary prevention for learning difficulties in mathematics.

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