

# Visuo-spatial ability improvements in typical development children involved in the Arrowsmith Program

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## INTRODUCTION

### Background

- The Arrowsmith program is a cognitive intervention focused on the enhancement of multiple cognitive processes whose weakness is associated with learning disabilities (Bryant, 2015; Weber et al., 2019).
- The Symbol Relations Task is a computer based visual-spatial processing task with increasingly levels of difficulty. This task is based on analogical clocks reading that involves not only counting but also perceptual-recognition strategies (Siegler & McGilly, 1989), and operation abilities to establish relationships on clocks times (Friedman, & Laycock, 1989).
- Exploratory results of a 6-week intensive intervention using The Symbol Relation Task in students with learning disabilities have revealed significant improvements in processing speed and global cognitive efficiency (Rose & Jagger-Rickels, 2019).

### Aim

- To explore the involvement of different perceptual and cognitive processes in this task, and how these processes could be improved in typical developing children.

## METHOD

### Participants

- 17 typical development children aged 8-9 ( $M = 8.12$ ,  $SD = .22$ ), who belonged to the same school.

### Materials

- Trail Making Test (processing speed), Rey-Osterrieth Complex Figure Test (visuo-spatial construction, copy and recall), Wisc Symbol-number (visuo-spatial memory, Raven's Matrix A, B, C, D., E (fluid intelligence). Arrowsmith Clocks assessment parts A and B.

### Procedure

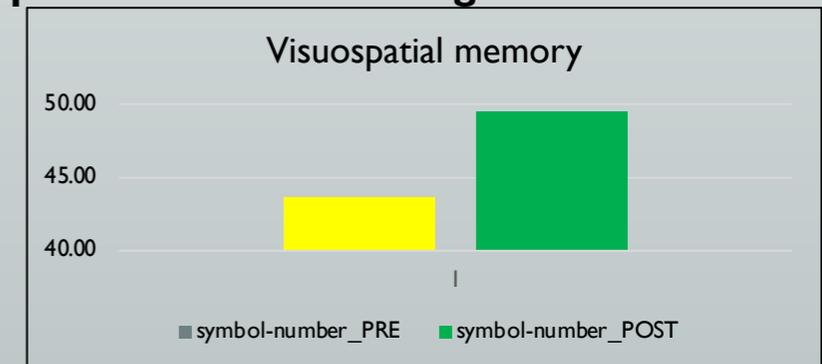
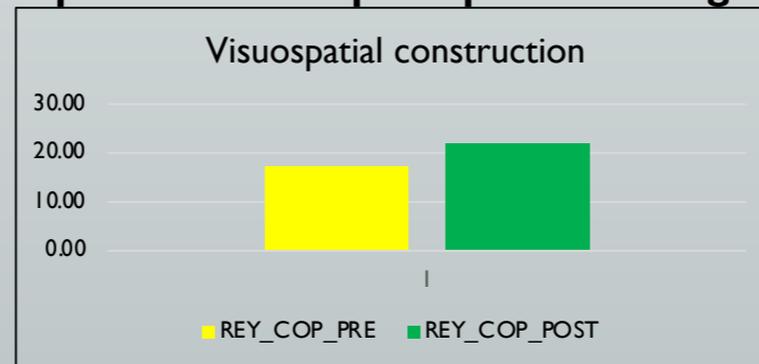
- 3-month longitudinal study
- Children were assessed within one week of the beginning of the intervention and immediately after the training was completed.

## RESULTS

### Involvement of perceptual and cognitive processes in Symbol Relations Task

- Significant correlations among initial clocks assessment and fluid intelligence ( $r = .73$ ,  $p = .01$ ) and visuo-spatial construction (copy) ( $r = .60$ ,  $p = .02$ ).

### Improvements in perceptual and cognitive processes after training



## DISCUSION

- Overall, children improved their visuospatial abilities after three months of training regarding our baselines.
- Our results pointed out that the intervention using The Symbol Relations Task could be effective not only in students with learning disabilities but also in typical developing children.
- Further research is needed to determine how the cognitive mechanisms involved may be differently involved in children with and without learning disabilities in the Symbol Relations Task

## REFERENCES

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