

Understanding reversal errors in dyslexia: The role of the magnocellular/dorsal visual stream

Marie Houbben¹ & Gilles Vannuscorps^{1,2}

(¹) Psychological Sciences Research Institute, Université catholique de Louvain, Belgium

(²) Institute of Neuroscience, Université catholique de Louvain, Belgium

INTRODUCTION

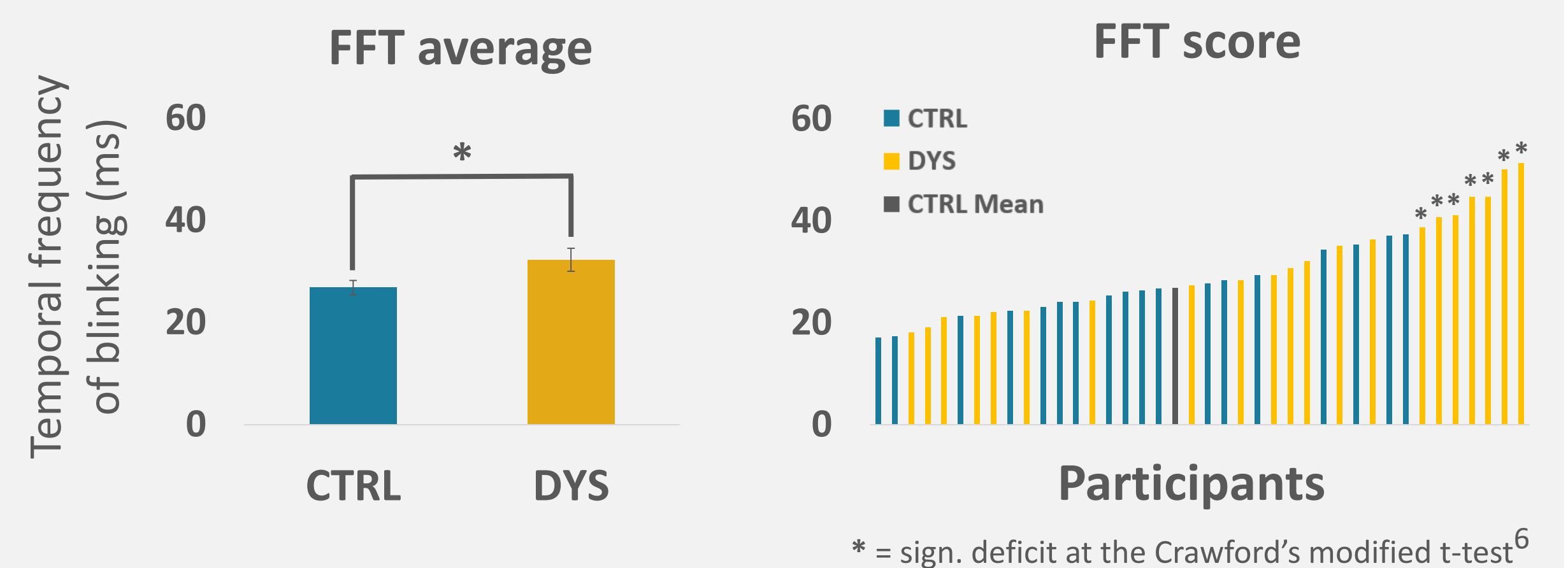
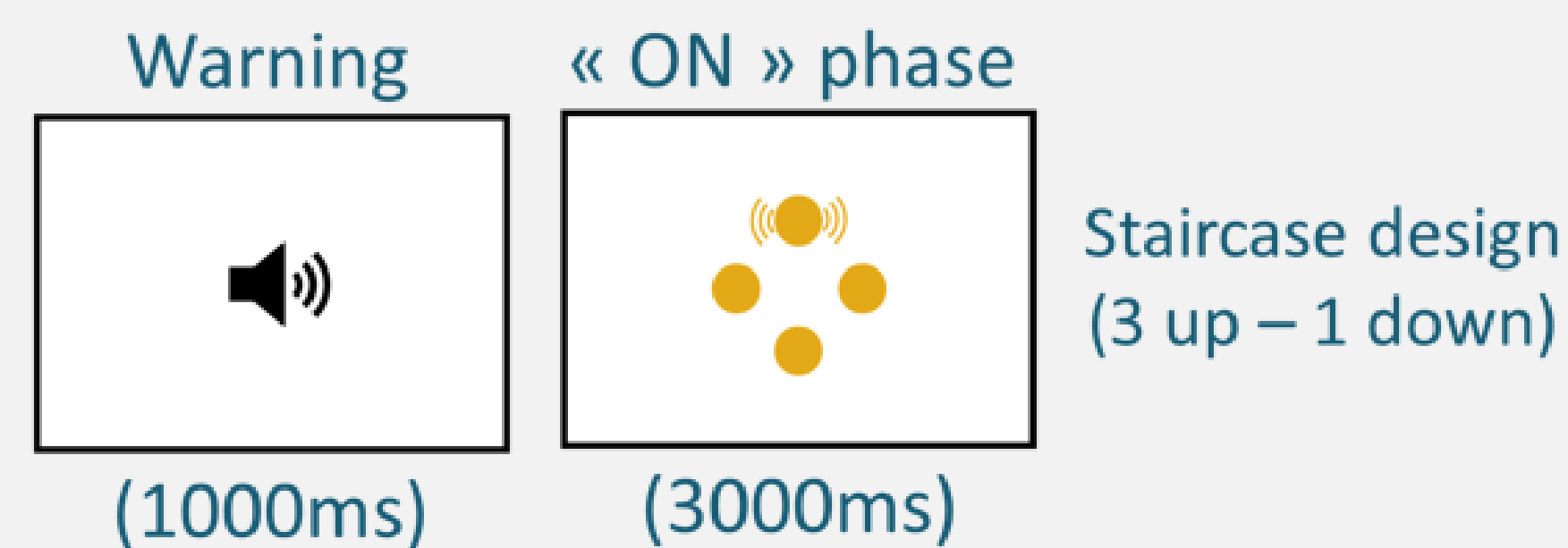
- Reversal errors (e.g., reading “b” for “d”) have been considered a hallmark of dyslexia for decades¹ but their nature and origin remain elusive.
- Some studies suggest that damage to the magnocellular-dorsal visual stream may affect the ability to discriminate mirror images^{2,3}, and other studies indicate that at least some people with dyslexia have a deficient M-dorsal stream^{4,5}.
- We hypothesized that dyslexic children who have a deficient M-dorsal stream suffer from mirror letter confusions.

METHOD AND RESULTS

- 43 children (6th grade)
 - 22 without dyslexia (CTRL)
 - 21 with dyslexia (DYS)
 - 3 behavioral tasks
 - Flicker Fusion Threshold (FFT)
 - Lexical decision
 - Orientation judgment (=/ $\neq$)
- (data collection in progress)

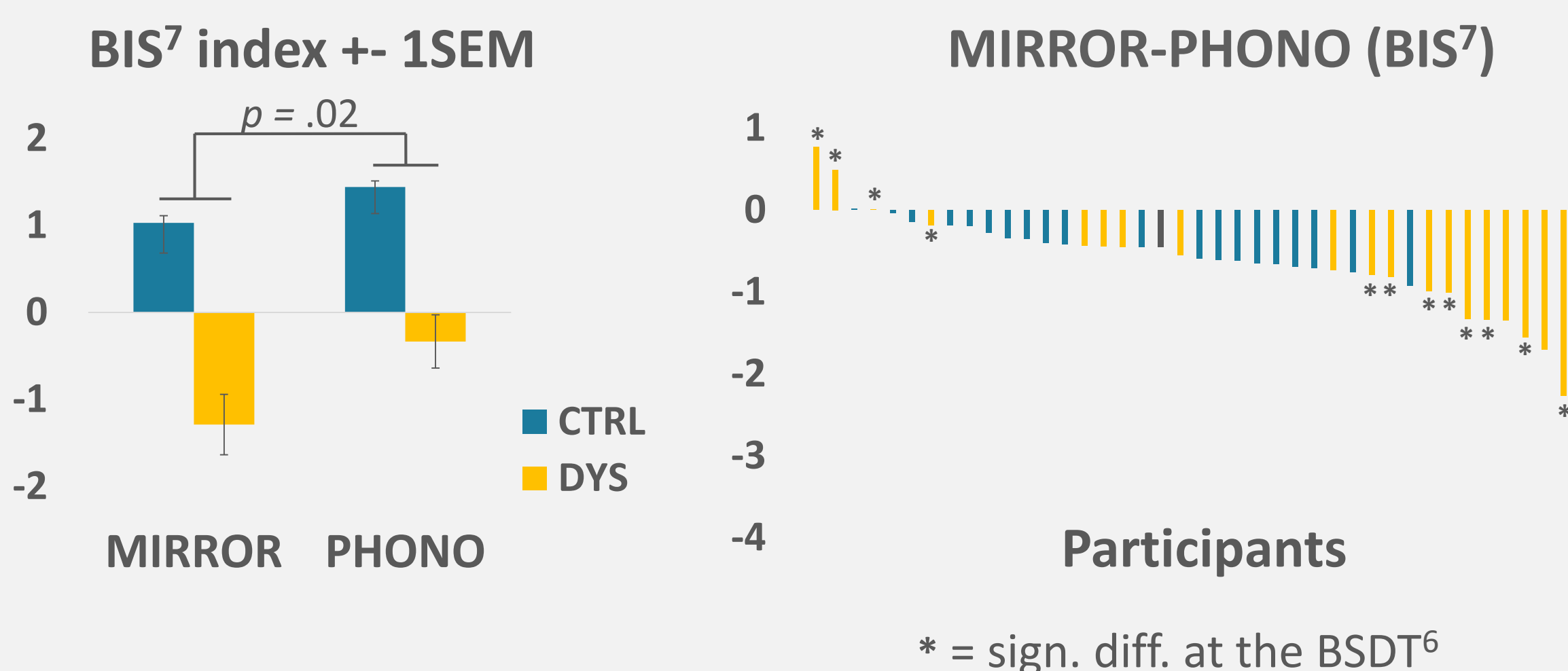
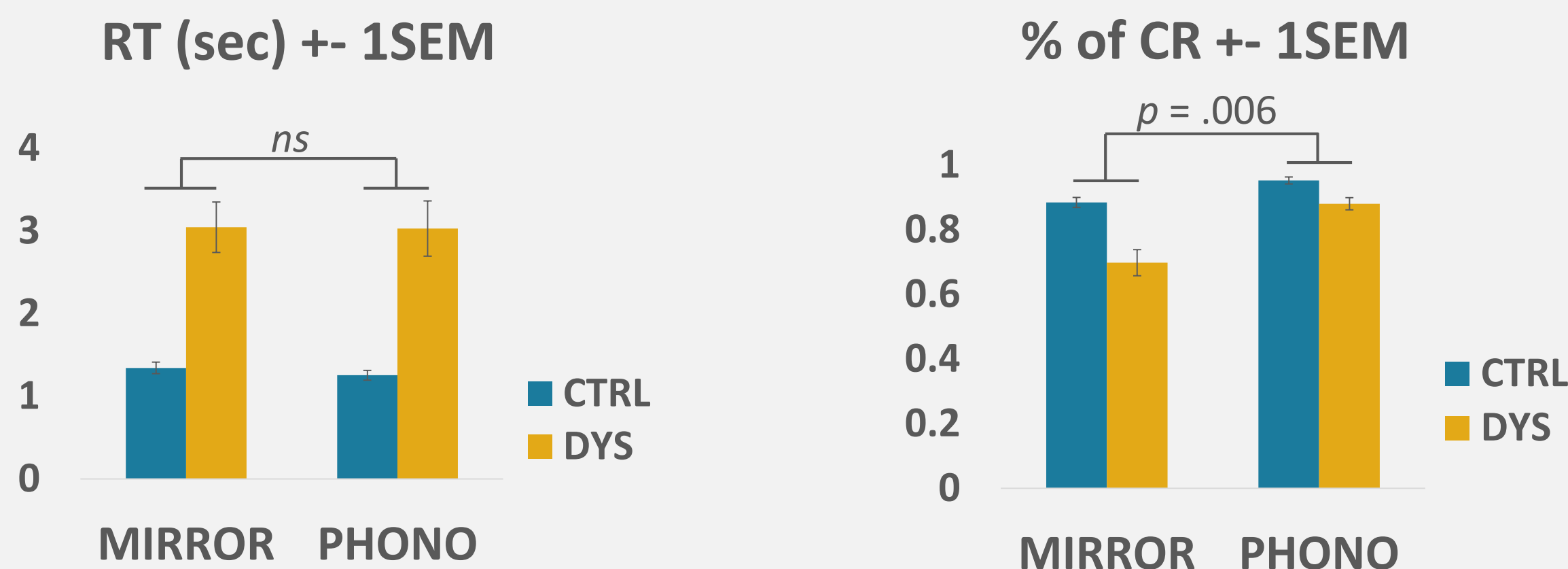
A deficient M-dorsal stream?

« Which led was blinking ? »



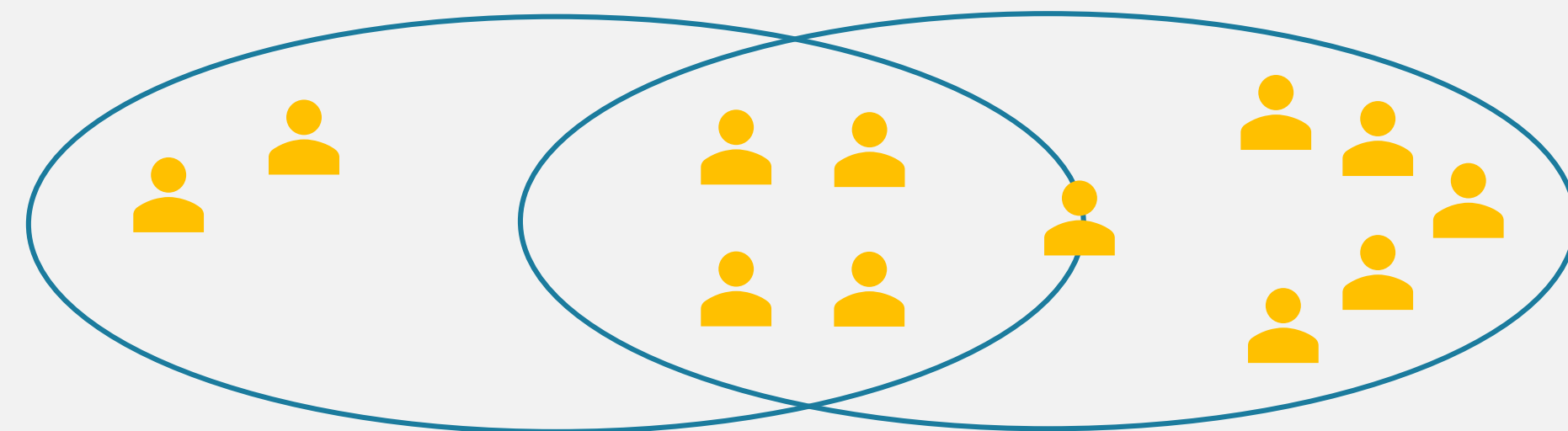
Mirror or phonological errors?

« Is this a word ? »



A deficient M-dorsal stream = mirror errors?

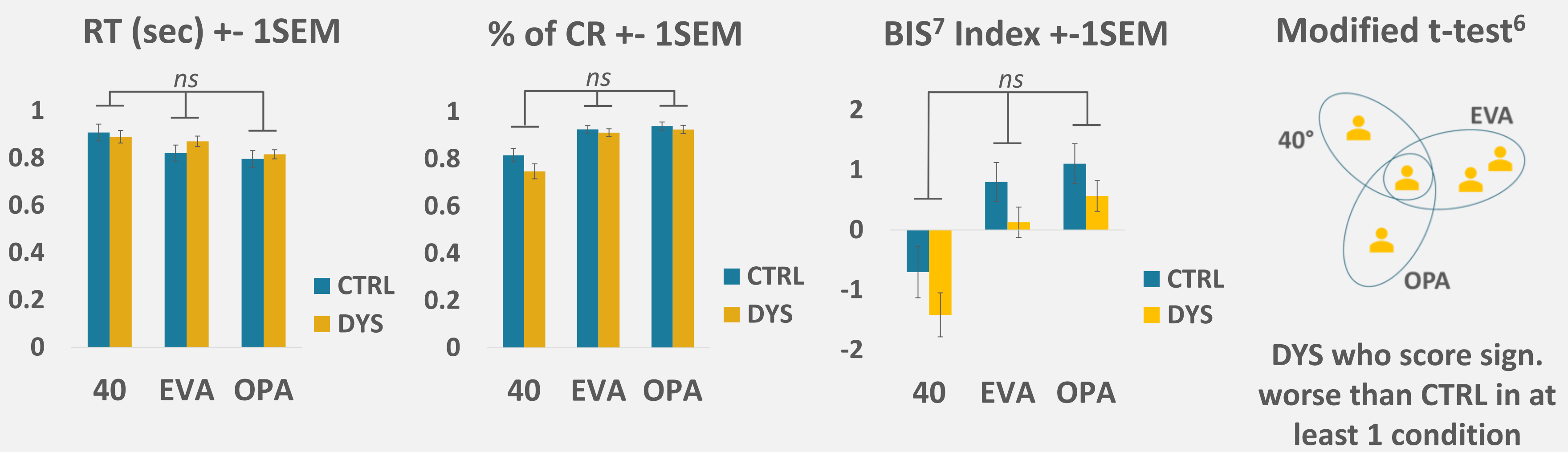
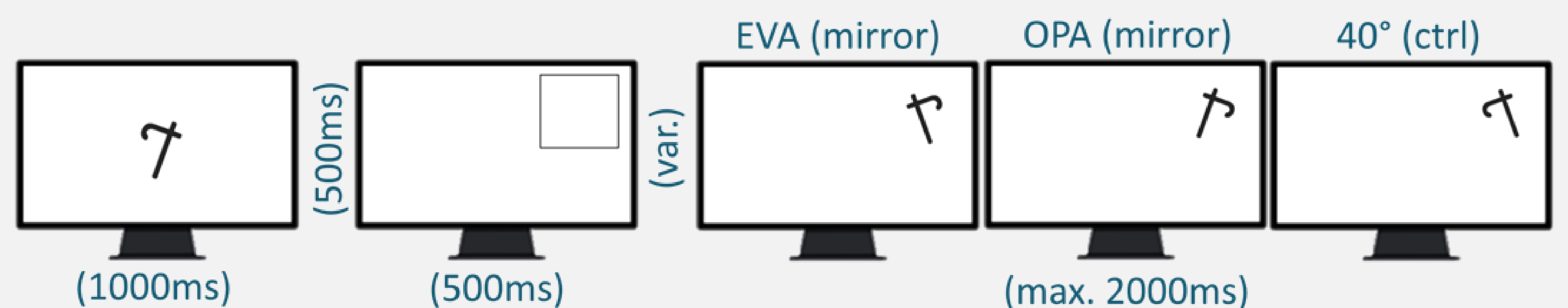
DYS who score significantly worse than CTRL in the FFT task (according to the modified t-test⁶)



DYS who have a greater deficit in the “mirror” condition than in the “phono” condition in the lexical decision task (according to the BSDT⁶)

What type of orientation error?

« Press the button if orientation is different »



DISCUSSION

- Our preliminary results indicate that :
 - 33% of the dyslexic children from our sample have a “less-efficient” M-dorsal stream;
 - 47% of the dyslexic children from our sample have more difficulty to detect mirror than phonological errors;
 - 40% of the dyslexic children who have more difficulty to detect mirror than phonological errors have also a “less-efficient” M-dorsal stream.
- So far, the results of the orientation same/different judgment task do not allow us to draw clear conclusions but there seem to show a tendency for dyslexic children to perform worse than controls in all orientation conditions.

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