

STATISTICAL LEARNING IN DYSLEXIA

Statistical learning abilities of children with developmental dyslexia across three experimental paradigms



Merel van Witteloostuijn¹, Paul Boersma¹, Frank Wijnen² & Judith Rispens¹
University of Amsterdam¹, Utrecht University²
m.t.g.vanwitteloostuijn@uva.nl



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BACKGROUND

Statistical learning = a domain-general learning mechanism for the extraction of statistical regularities from input (Frost et al. 2015)
= assumed to support language and literacy acquisition (Arciuli & Simpson 2012; Frost et al. 2013)
= hypothesized to be deficient in dyslexia (Nicolson & Fawcett 2007; 2011; Ullman & Pierpont 2005)

RESEARCH QUESTION Do children with dyslexia experience problems with statistical learning?

If children with dyslexia experience domain-general problems with statistical learning, group differences are expected regardless of the specific task

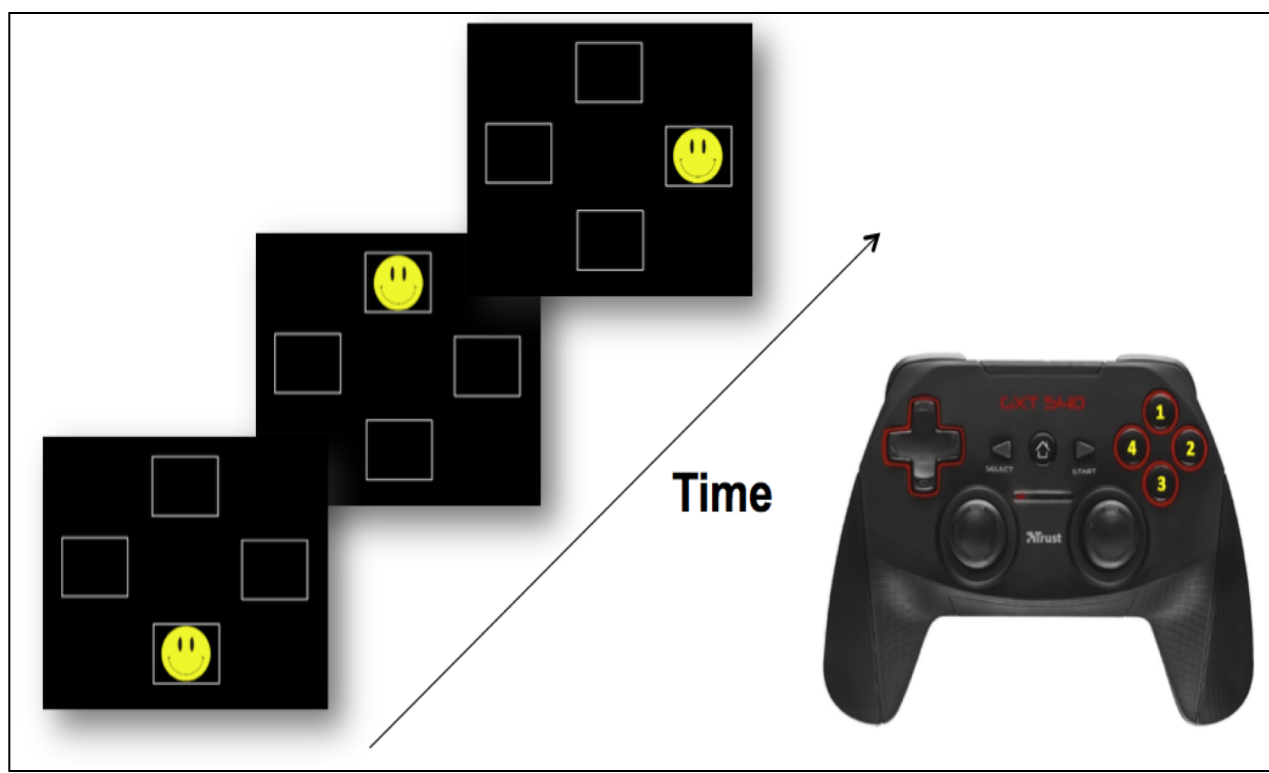
METHODS

Participants

Developmental dyslexia (DD): N = 50 (26 girls, 8;4 – 11;2)
Control (TD): N = 50 (24 girls, 8;4 – 11;2)

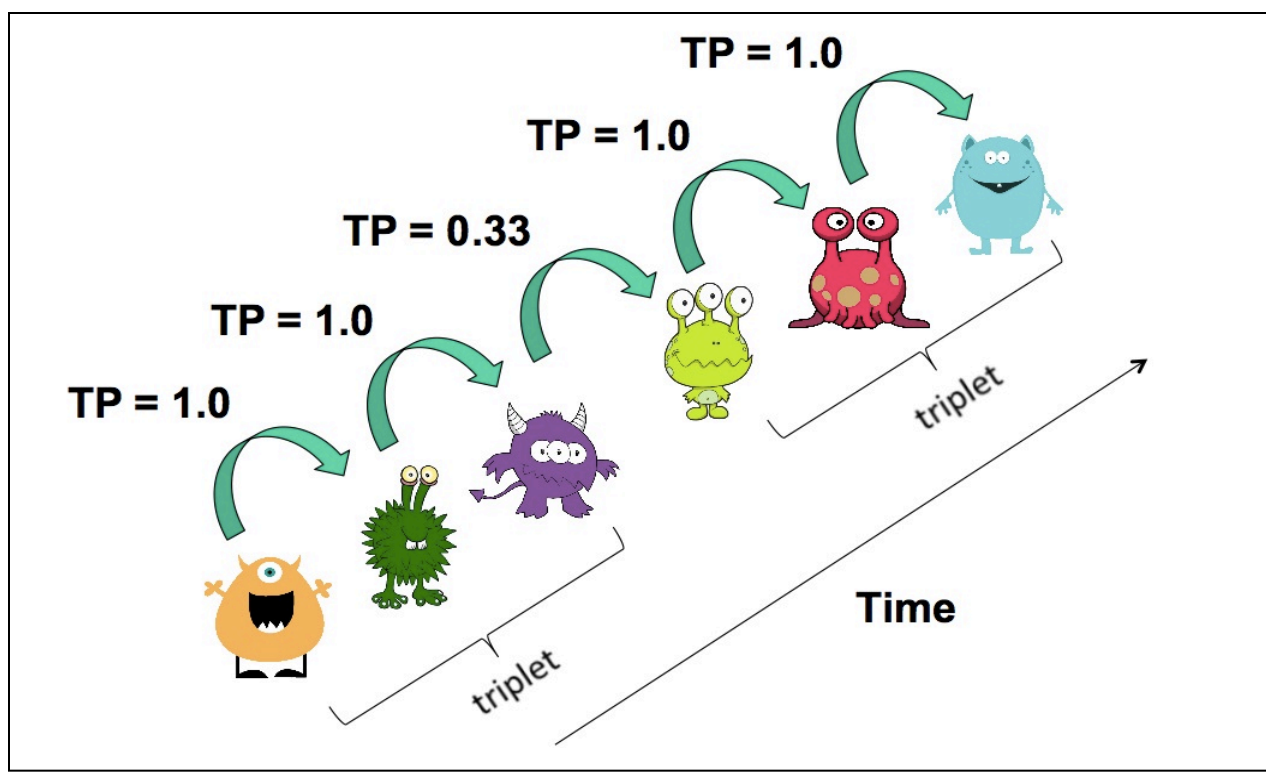
Serial Reaction Time (SRT)

- 10-item sequence in block 2 – 5 & 7
- Sequence disrupted in block 6
- Online: RT disruption vs. RT sequence



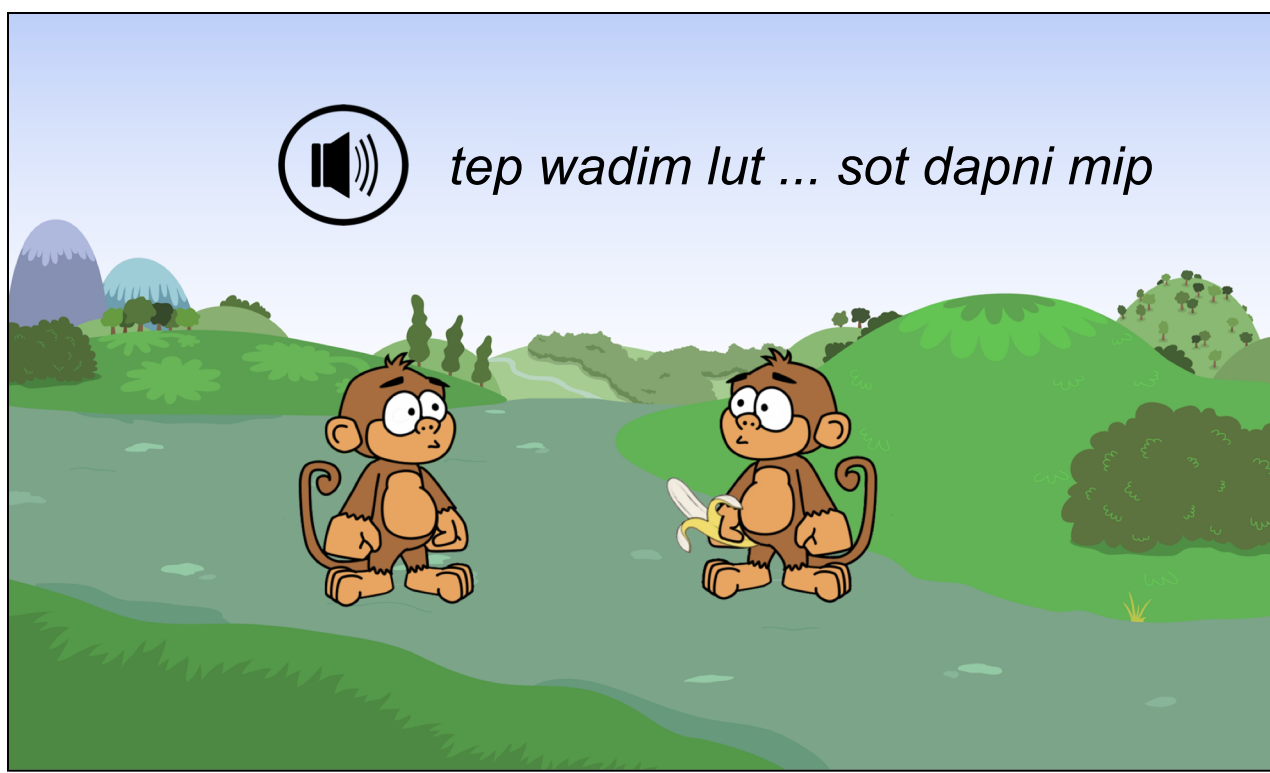
Visual Statistical Learning (VSL)

- Self-paced task
- Triplet structure
- 24 repetitions over 4 blocks
- Online: RT unpredictable vs. RT predictable
- Offline: accuracy (3-AFC & 2-AFC)



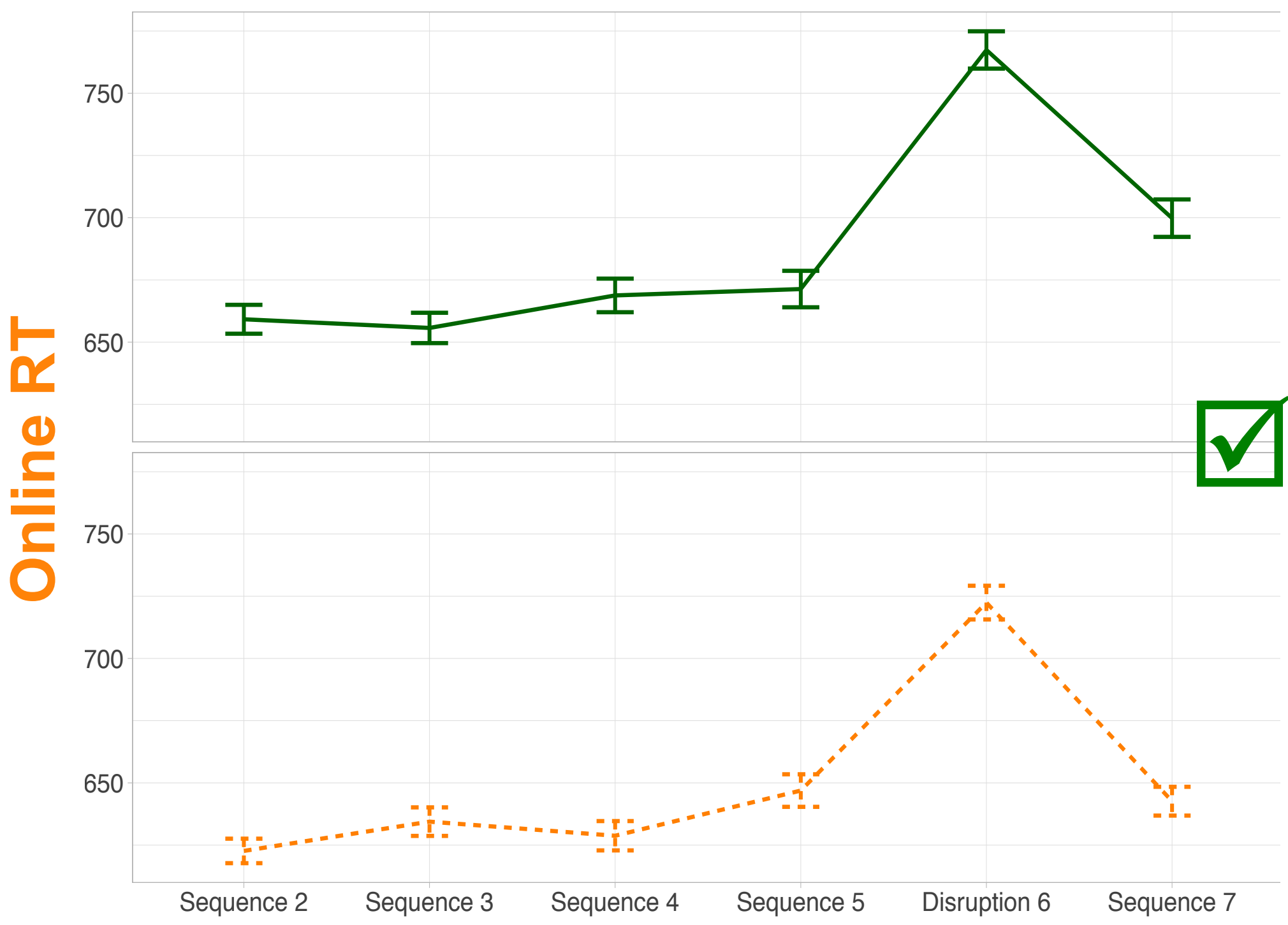
Auditory nonadjacent learning (A-NADL)

- Word monitoring task
- NA rule in blocks 1 – 3 & 5
- Rule disrupted in block 4
- Online: RT disruption vs. RT rule
- Offline: accuracy (GJT)

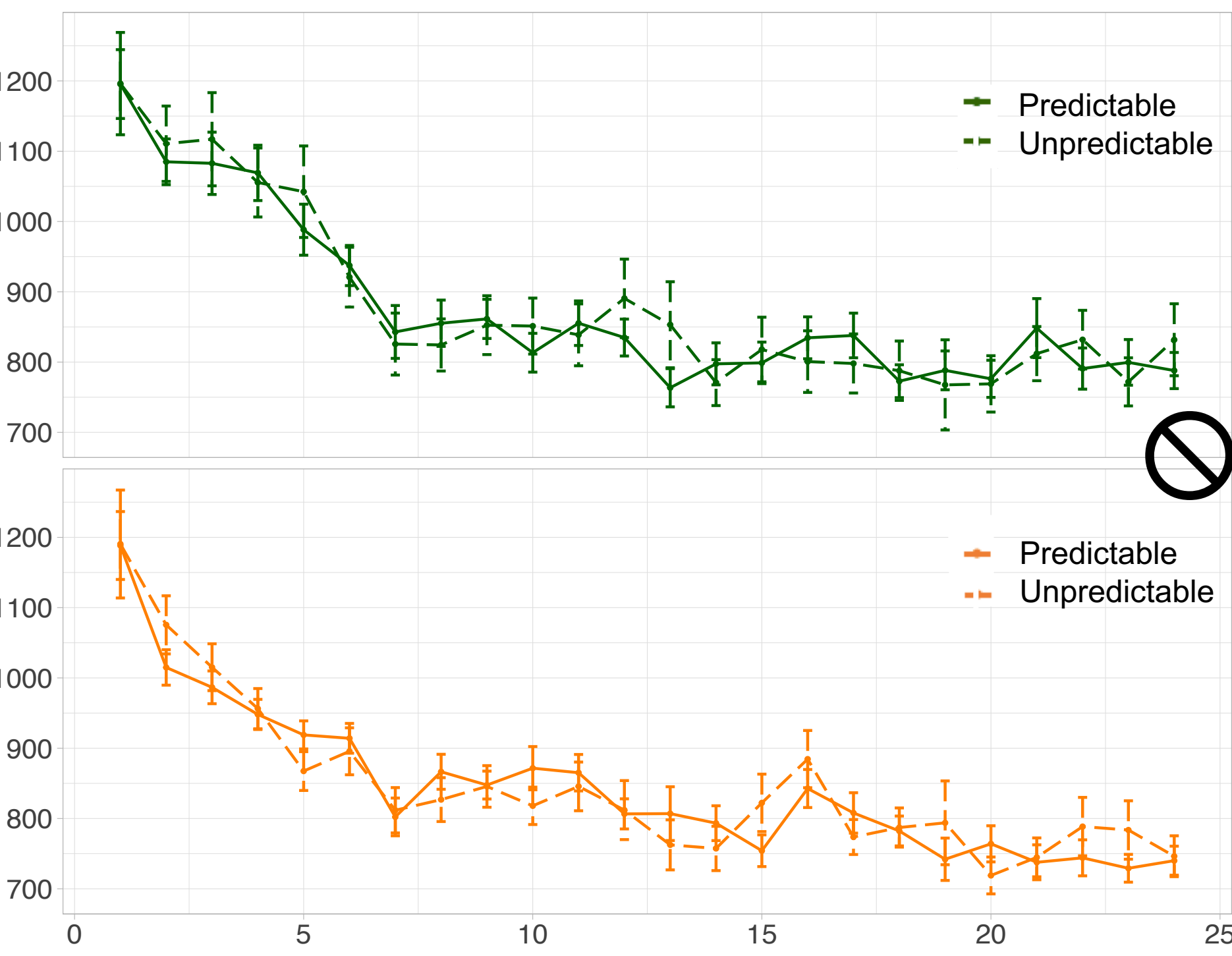


RESULTS

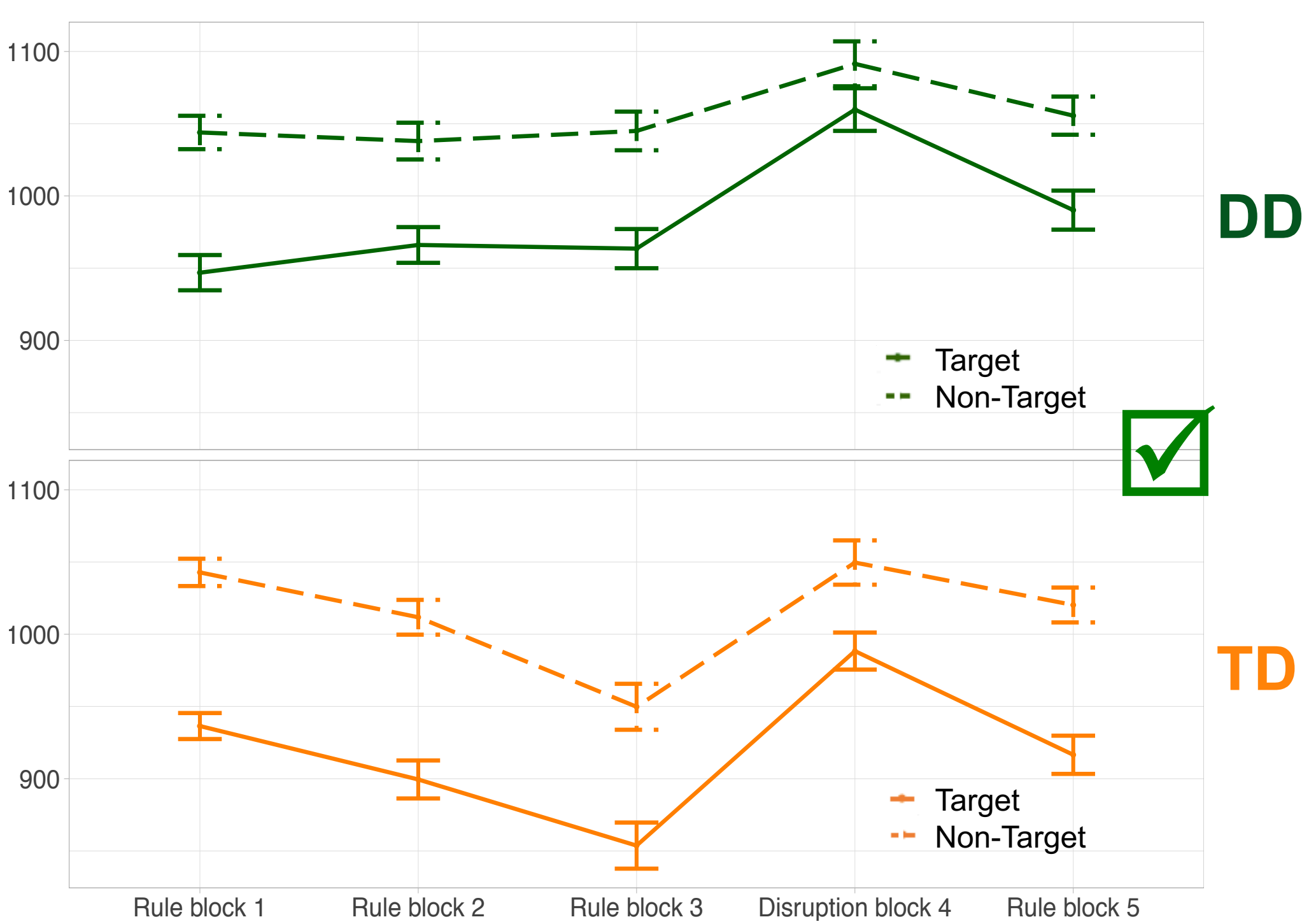
SRT



VSL



A-NADL



Analyses

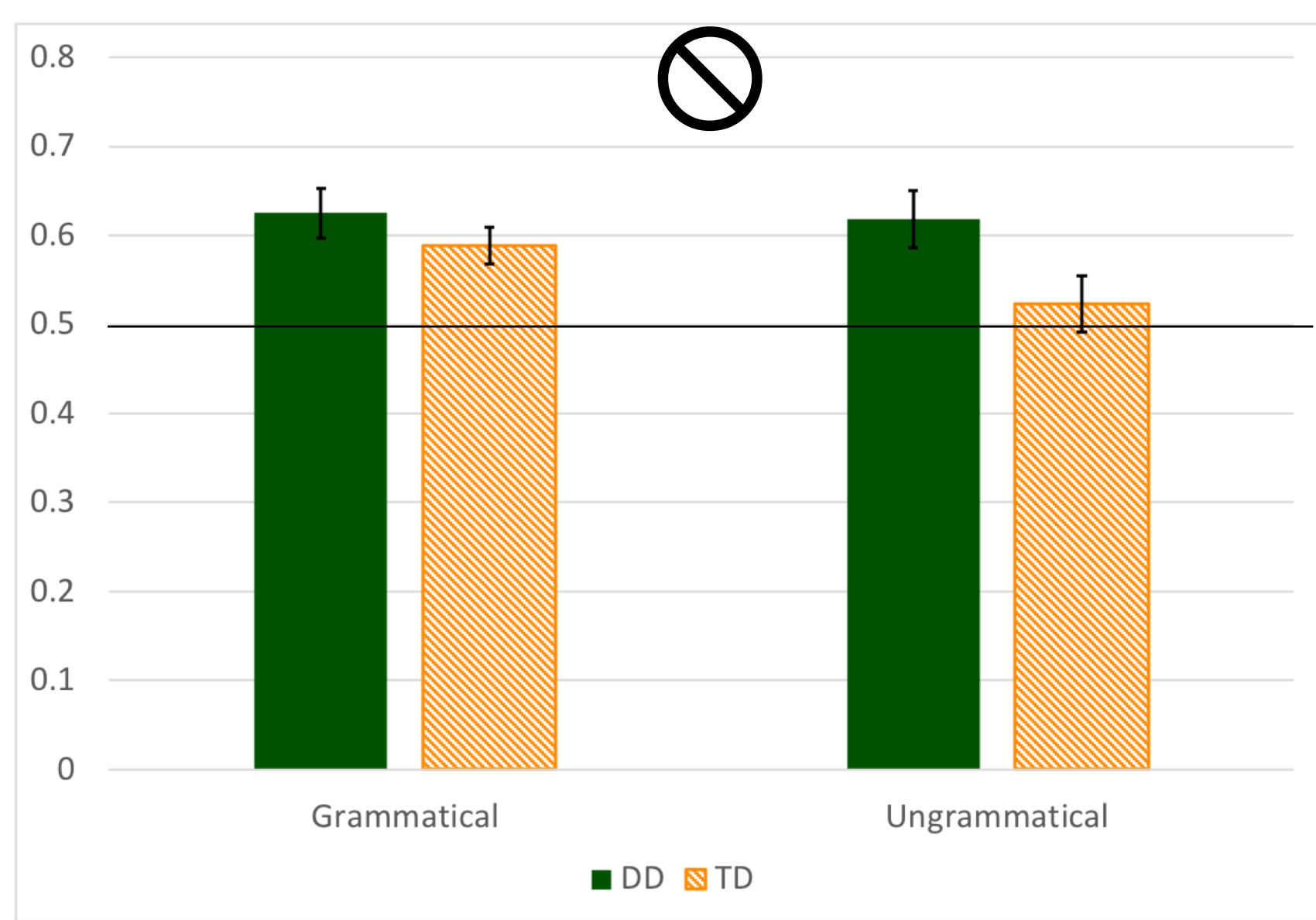
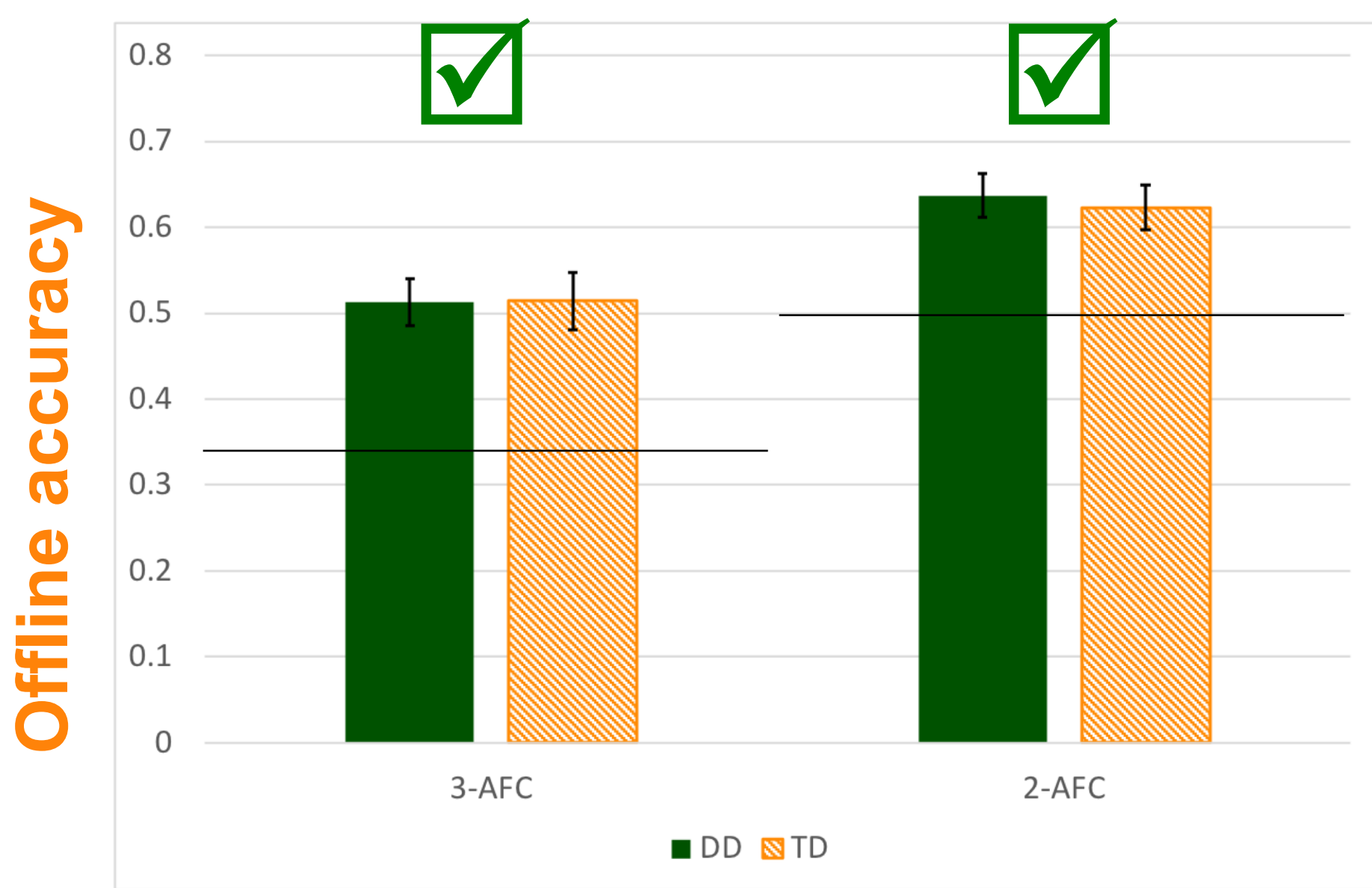
Linear mixed effects models, controlled for

- Sustained attention
- Short-term memory

Evidence of learning

No evidence of learning

None of the models reveal an effect of group



CONCLUSIONS

- (1) Evidence of statistical learning in all three paradigms
- (2) No evidence of a difference in performance between groups

Thus, we find no evidence in support of a (domain-general) statistical learning deficit in children with dyslexia

(see also Schmalz et al. 2016; van Witteloostuijn et al. 2017; West et al. 2017)