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# Insights from novel measures of visual statistical learning in children

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## BACKGROUND

**Statistical learning** is usually tested through:

- Exposure to continuous stream of stimuli
- Offline test-phase: 2-AFC

**Importance of online measure:** provides information about the learning trajectory during exposure.

Several researchers have shown that online measures provide reliable results with adult participants [1, 2, 3].

**Present study:** we assessed children's VSL abilities using

- an online reaction time (RT) measure [3]
- two distinct offline question types

## RESEARCH QUESTIONS

1. Are children able to extract statistical regularities from visual input?
2. Can we improve the methodology to measure statistical learning in children?

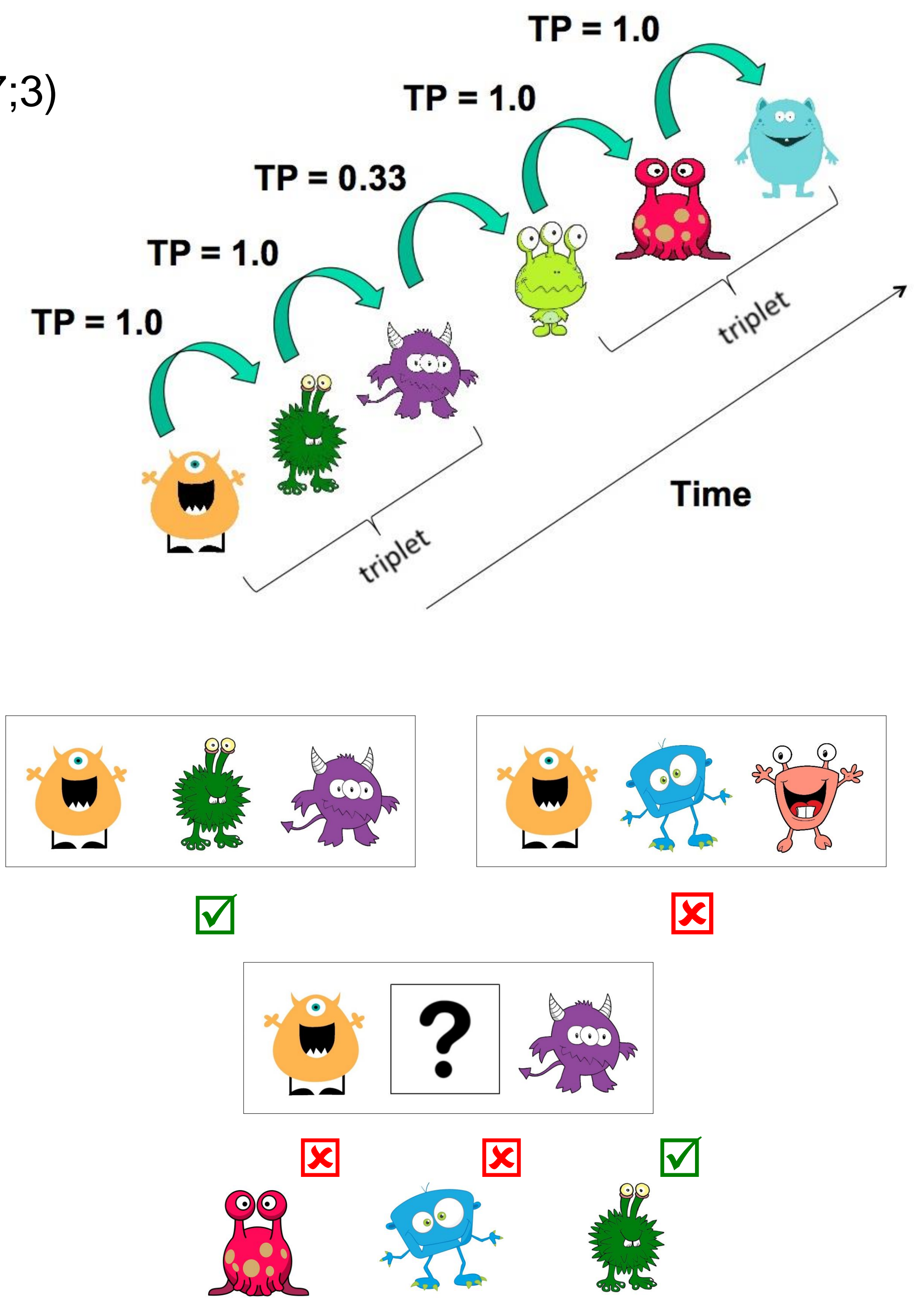
## METHODS

### Participants

53 Dutch children aged 5;9 – 8;7 (mean = 7;3)

### Self-paced VSL task

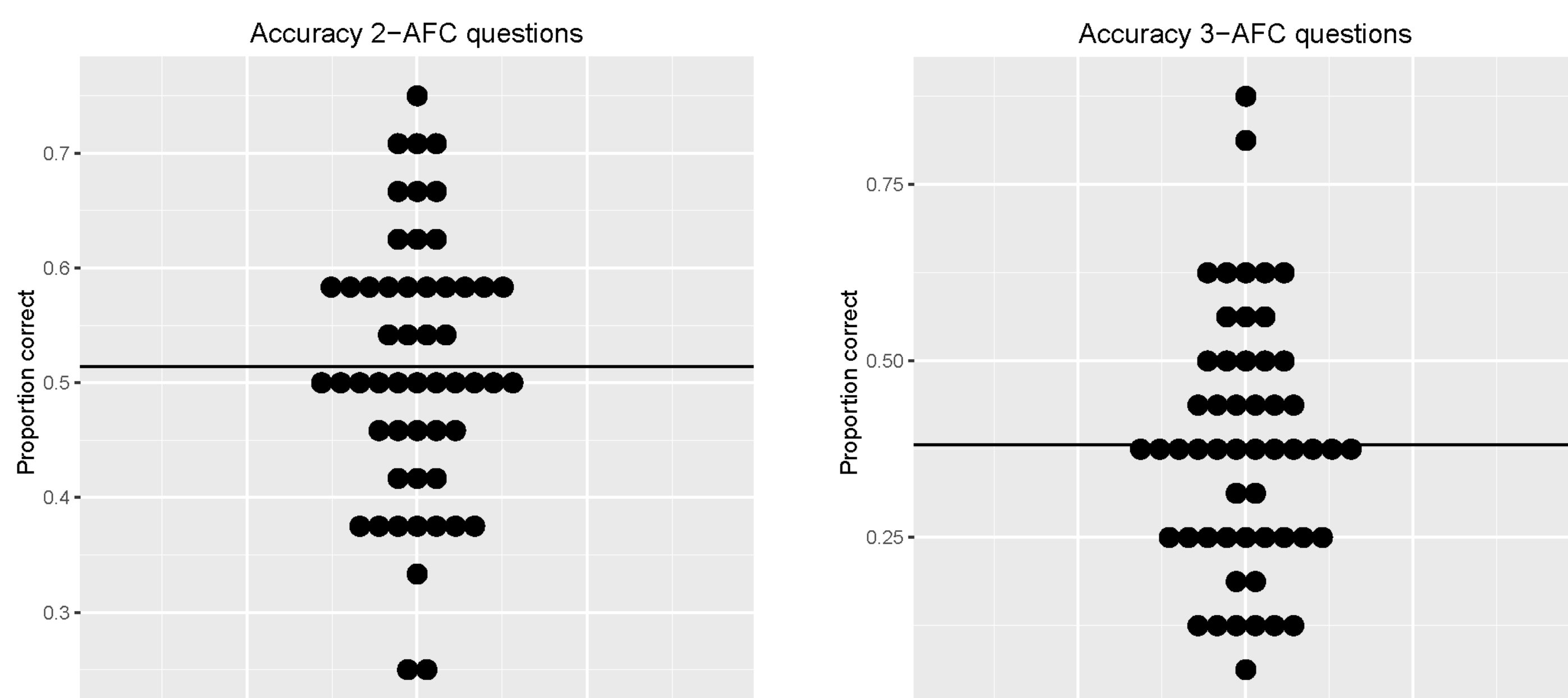
- ❖ Familiarization:
  - Continuous stream of individually presented aliens
  - Four triplets, presented 24 times divided over 4 blocks [4]
  - Online measure: RT to each alien is recorded. We expect that RT's to unpredictable aliens (alien 1) are longer than RT's to predictable aliens (aliens 2 and 3) [3]
- ❖ Offline test phase:
  1. Pattern recognition: 24 2-AFC ("Choose the familiar group")  
Chance = 50%
  2. Pattern completion: 16 3-AFC ("Complete the missing alien")  
Chance = 33%



## RESULTS

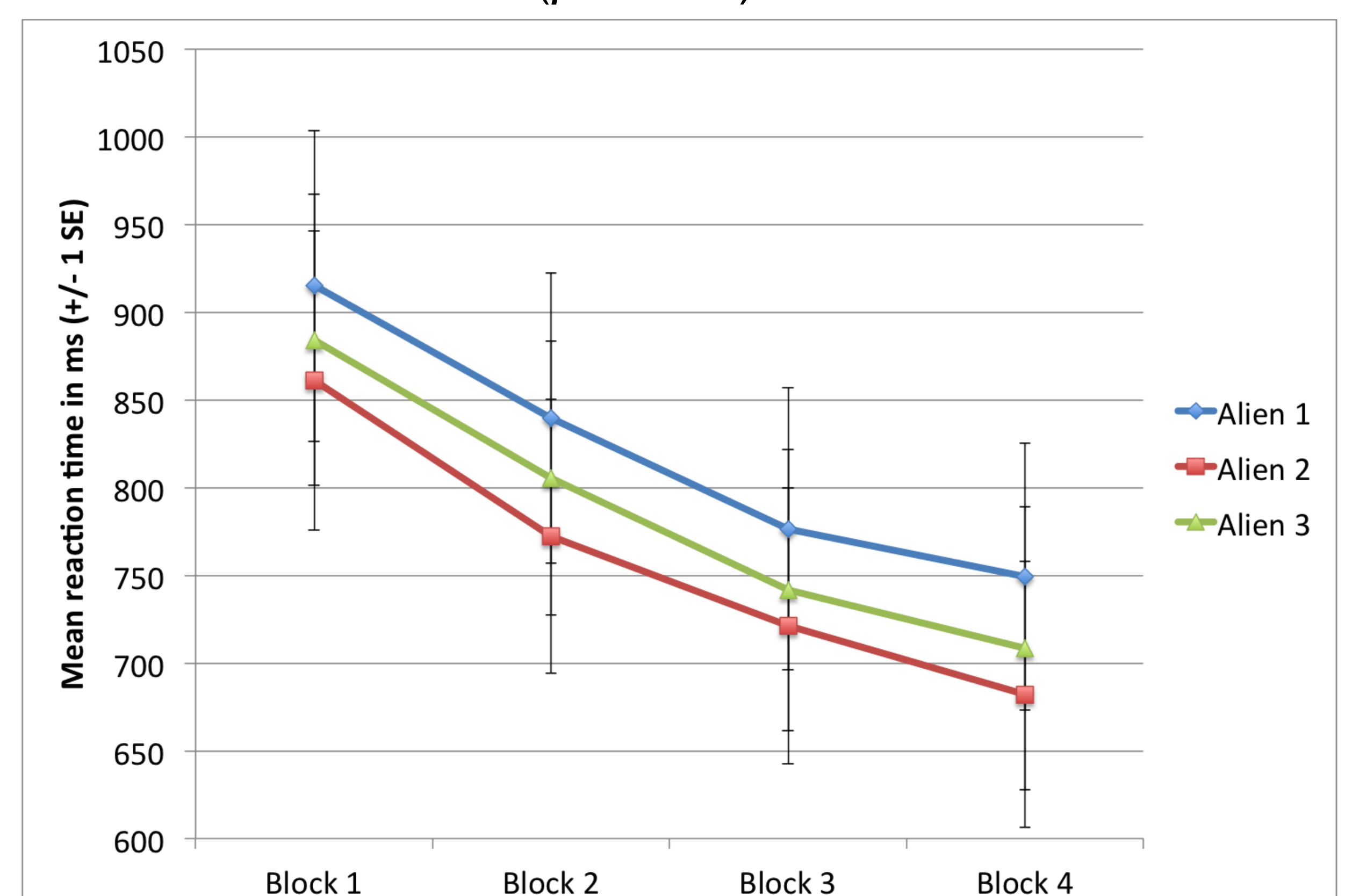
### Offline test phase measures

- ❖ Comparison children's performance to chance level:
  - Not above chance on 2-AFC questions ( $p = .372$ )
  - Above chance on 3-AFC questions ( $p = .042$ )



### Online RT measure

- ❖ Main effect of alien:
  - Alien 1 > Alien 2 ( $p < .001$ )
  - Alien 1 > Alien 3 ( $p < .001$ )
  - Alien 3 > Alien 2 ( $p = .037$ )



## REFERENCES

- [1] Misyak, Christiansen, & Tomblin (2010) [2] Karuza et al. (2014) [3] Siegelman, Bogaerts, & Frost (Submitted) [4] Arciuli & Simpson (2012)

## CONCLUSIONS

1. 3-AFC and online measures show that **children are able to learn the structure.**
2. Online measure provides **additional insights about the learning trajectory.**

