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Working memory computerised task and cognitive abilities



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Working Memory span task = memorising items + processing stimuli

Lepine, Barrouillet, & Camos (2005):

WM span is much more predictive of cognitive abilities with Computer-paced than with Participant-paced processing.
(stimuli presented at predetermined rate) (participant control the presentation rate of stimuli)

St Clair-Thompson (2007):

WM span is much more predictive of cognitive abilities with Experimenter-paced than with Participant-paced processing.
(experimenter launch stimuli when participant ended processing)

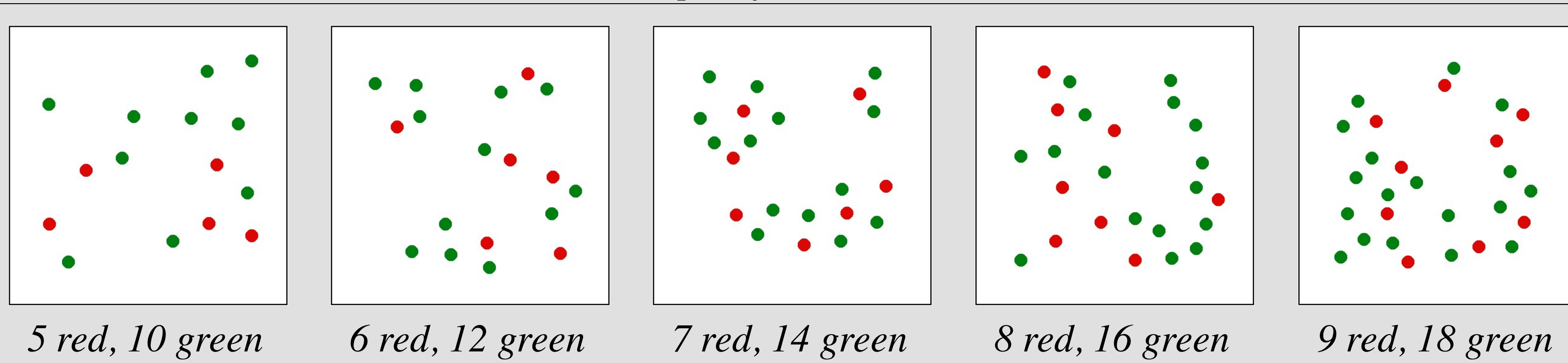
Conclusion: As Participant-paced leaves additional time to implement strategies, strategies do not contribute to relation between WM and cognitive abilities.

Does a Computer-paced task adjusted to participants capacities reduce strategies and increase prediction of cognitive abilities?

Material & procedure

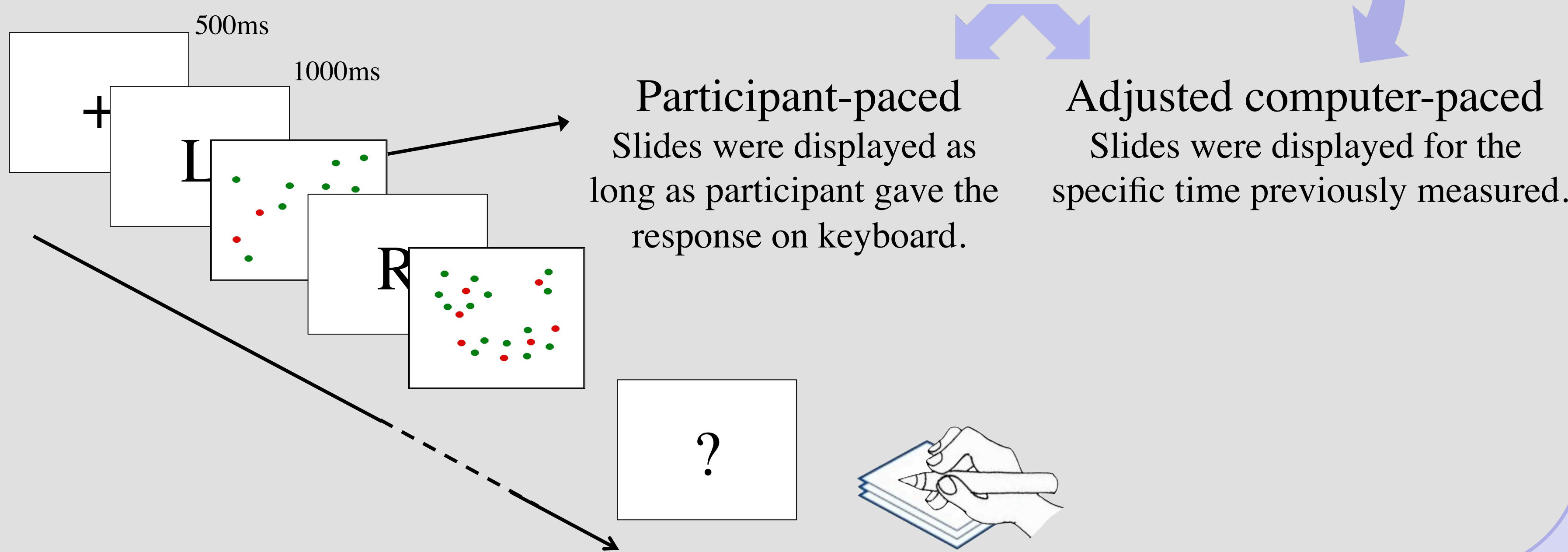
Counting Task: Report the number of red dots using keyboard.

Sample of the 60 slides



For each participant, the average time to count red dots on slides of a kind were calculated.

Counting span Task: Remember consonants (increasing length from 2 to 9 letters)
Count red dots on each slide, 2 conditions (within subject)



Cognitive abilities: French version of the DAT[©] (Differential Aptitude Tests)

Verbal

... is to right what Est is to ...
① Left North
② Direction Est
③ Right South
④ Sloping direction
⑤ Left Est

Numerical

Which digit replace the ? in this addition?

5	?
+	2

5	8

① 3
② 4
③ 7
④ 9
⑤ None

Abstract

Which picture complete the series?

① ② ③ ④ ⑤

➤ 25 problems for each cognitive ability
➤ 10 minutes to solve as much as possible

Results

Participants: 38 undergraduate students

		Memory score*	
		Participant-paced	Adjusted Computer-paced
Cognitive abilities mean number of problems solved in 10 min		4.82 (1.07)	4.45 (1.21)
Verbal	14.39 (4.92)	.43*	.24
Numerical	8.95 (3.69)	.40*	.29
Abstract	9.58 (4.25)	.38*	.25

* < .05

Conclusion

Participant-paced seems to be a stronger predictor of cognitive abilities ...

... inconsistent with data from:
- Lepine et al. (2005)
- St Clair-Thompson (2007)

Oral processing

Rehearsal -

Computer-paced predicted cognitive abilities

Silent processing

Rehearsal +

Participant-paced predicted cognitive abilities

Are cognitive abilities predicted by Computer-paced WM or by prevention of rehearsal?