



# Working memory computerised task and cognitive abilities

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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)

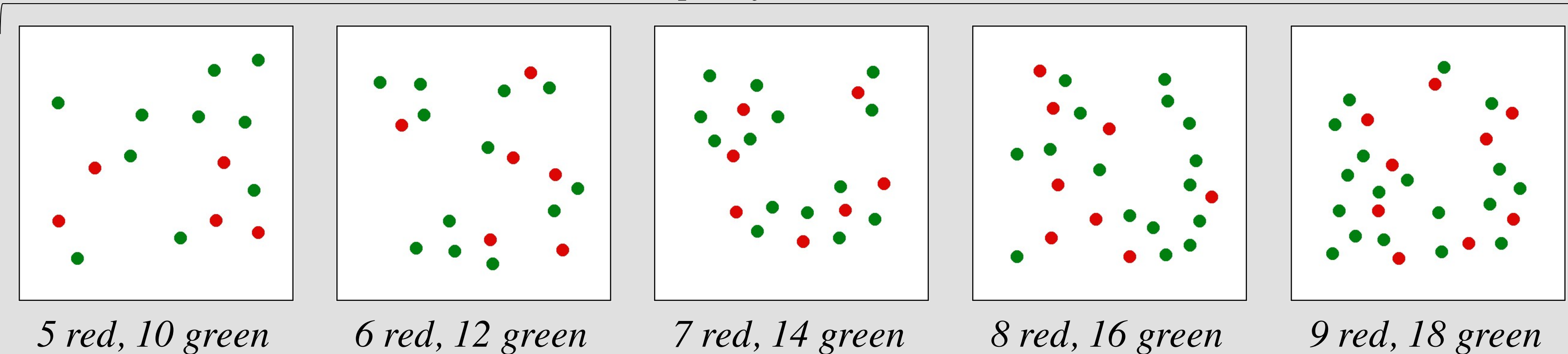
**Conclusion:** As Participant-paced leaves additional time to implement strategies, strategies do not contribute to relation between WM and cognitive abilities.

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

## Material & procedure

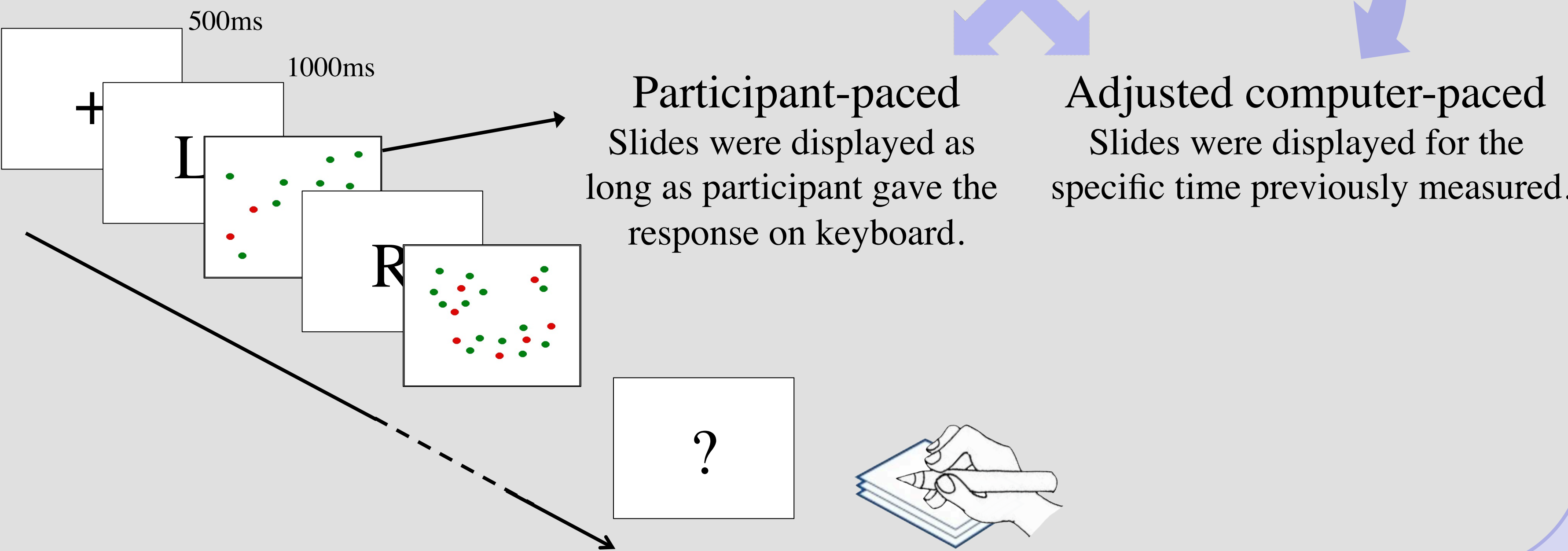
**Counting Task:** Report the number of red dots using keyboard.

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?

$$\begin{array}{r} 5 \ ? \\ + \ 2 \\ \hline 5 \ 8 \end{array}$$

- 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

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