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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)

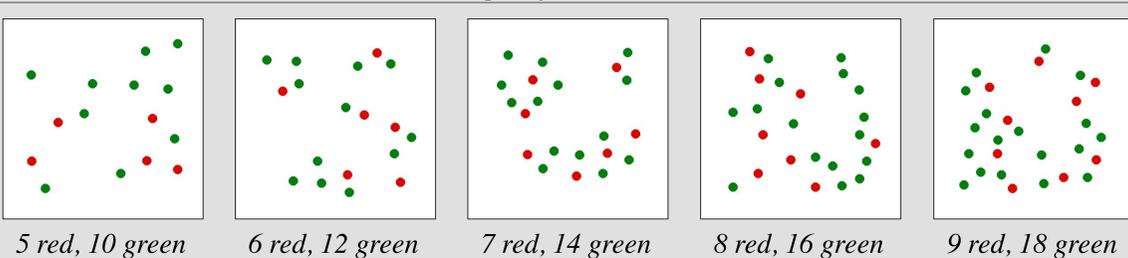
**Conclusion:** As Participant-paced leaves additional time to implement strategies, strategies do not contribute to relation between WM and cognitive abilities.

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

## Material & procedure

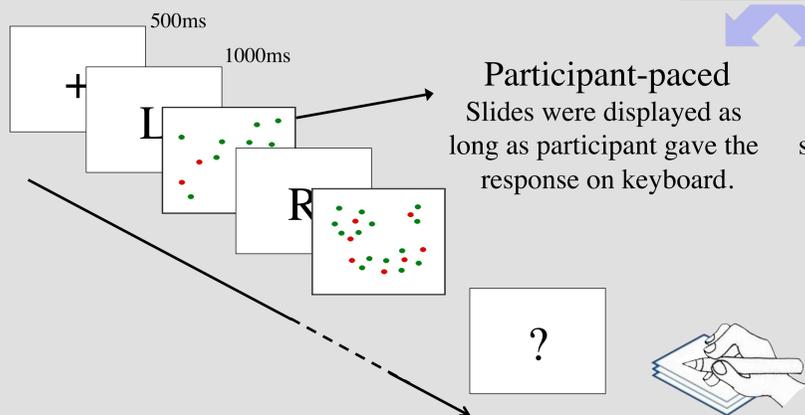
**Counting Task:** Report the number of red dots using keyboard.

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)



**Participant-paced**  
Slides were displayed as long as participant gave the response on keyboard.

**Adjusted computer-paced**  
Slides were displayed for the specific time previously measured.

**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
58	

  
 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?*