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RESEARCH CONFERENCE
NEXT GENERATION INSIGHTS ON
INTRACTABLE NATIONAL AND
GLOBAL CHALLENGES

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Exploring working memory, reading and academic achievement

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Introduction



- ◎ What is working memory (WM)?
 - ◎ Limited-capacity neural system
 - ◎ Allows us to keep information in mind while ignoring distraction
- ◎ What do we use WM for?
- ◎ Why should the South African education system explore the role of WM?



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Literature review



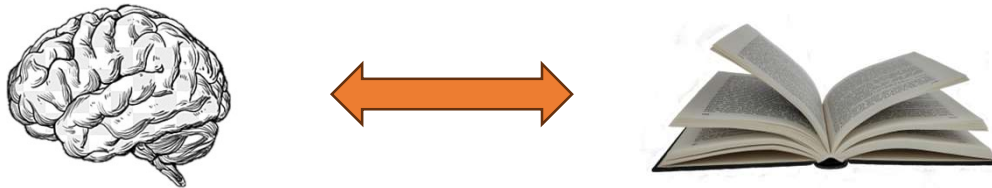
- ① Reading depends on cognitive processes that **take place in WM**
- ① Relationship between WM and reading supported in both English L1 and L2 readers
- ① Stronger relationship during more challenging tasks



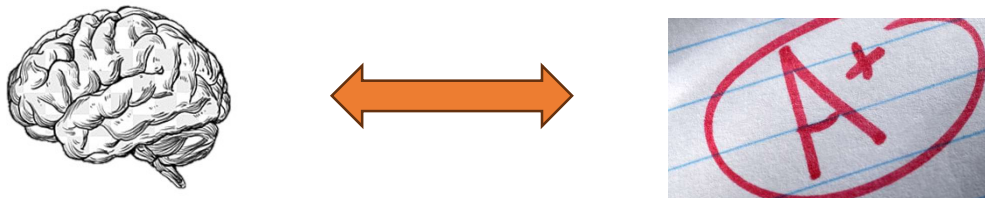
Research questions



◎ Is WM positively correlated to reading?



◎ Is WM positively correlated to academic achievement?



◎ What are the contributions of WM and reading to academic achievement?

Methodology



- ◎ **Paradigm:** Positivist
- ◎ **Conceptual framework:** Multicomponent WM model; Interactive approach to reading; Constrained capacity model
- ◎ **Research design:** Non-experimental ex post facto cross-sectional
- ◎ **Sample:** 136 Online Distance e-Learning first-year undergraduate students
- ◎ **Methods:** Test of Academic Literacy Levels (TALL), Reading Span, and Operation Span



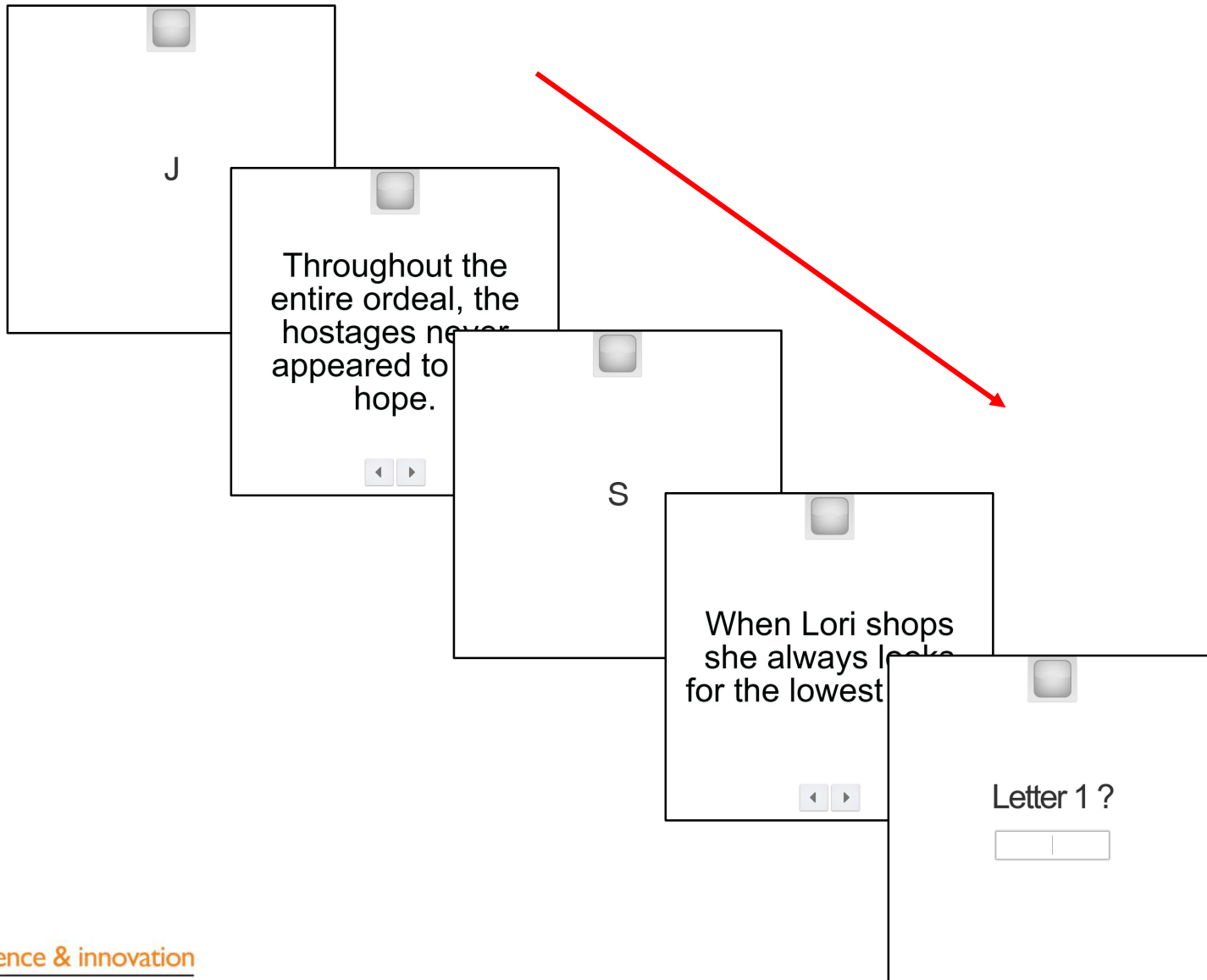
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WM tasks: RSPAN and OSPAN



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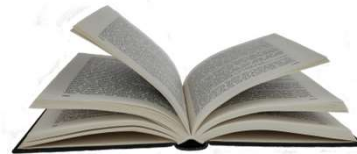
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Findings (1/2)

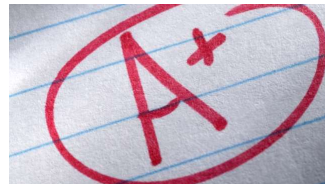


- Significant positive correlation between WM and reading



$$\tau = .10, p = .050$$

- Significant positive correlations between WM and academic achievement

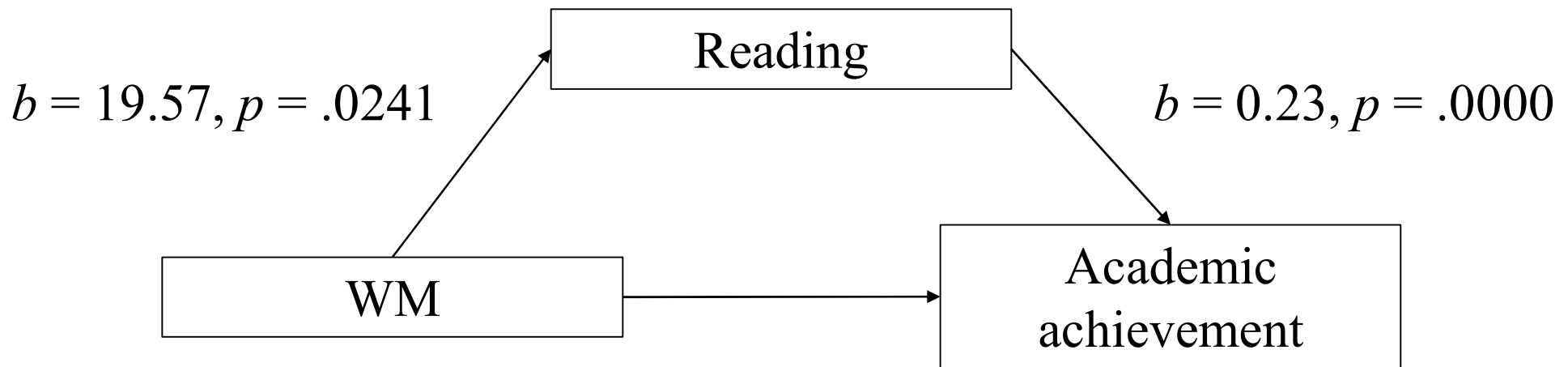


$$\tau = .16, p = .003$$

Findings (2/2)



- Mediation analysis showed that both WM and reading contribute to achievement
- There is also an indirect effect of WM through reading



Direct effect, $b = 10.10, p = .0166$

Indirect effect, $b = 4.55, 95\% \text{ CI } [0.07, 9.94]$



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Discussion



- ◎ Findings support theory that WM can enable or constrain reading and achievement
- ◎ However, the influence of WM was not as strong as expected
 - ◎ Homogenous sample
 - ◎ TALL not taxing enough
 - ◎ Online testing



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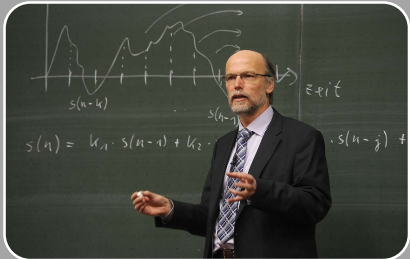


Future directions



Researchers

- Corpus of empirical research including diverse samples
- Working memory training



Lecturers

- Cognitive demands of text presentation
- Supplementary material for terminology and concepts



Students

- Study techniques



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Meaningful for students



”

Your study has helped me a lot with decluttering my mental space. I have started to use less digital media simultaneously, reduced multitasking and I have started TM (transcendental meditation) as a meditation practice.

...

I hope this study transforms other people's lives as much as it's transformed mine

“