

# Dyslexia: The influence of spelling on handwriting

thewaterloofoundation\*

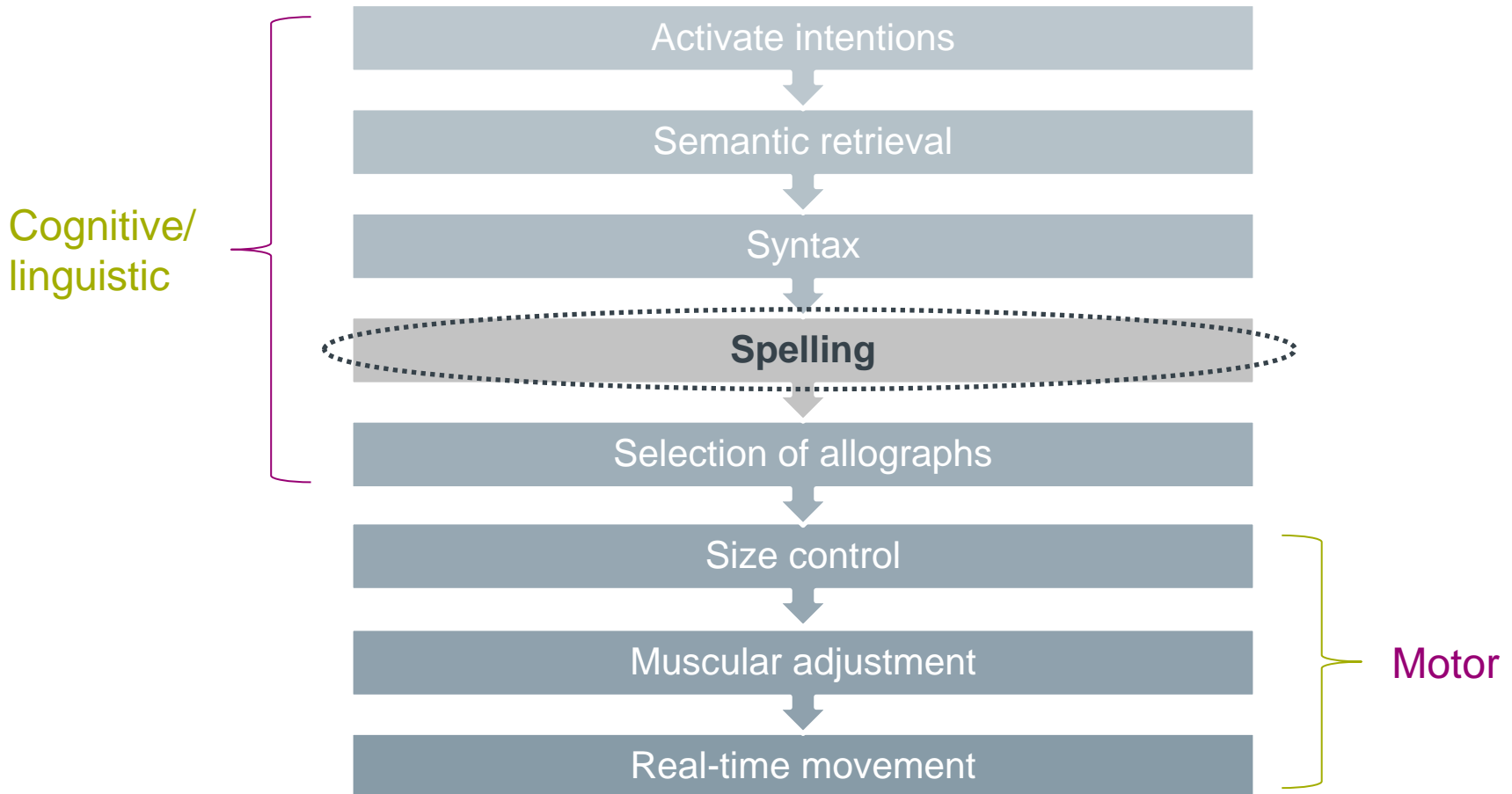


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# HANDWRITING MODEL

Van Galen (1991) hierarchy of processing modules:



# RESEARCH AIMS

## To investigate the production of text using a writing tablet:

- Do children with dyslexia demonstrate a slower handwriting speed than their peers?
- Does poor spelling ability influence the rate of transcription?
- Are children with dyslexia pausing frequently while writing?

# PARTICIPANTS

- 31 children with **dyslexia** (mean age 9 years)
  - 31 typically developing age controls (9 years old)
  - 31 spelling-ability matches (6 years old)
- Selection measures:
  - Cognitive ability
  - Phonological awareness
  - Reading and non word reading
  - Spelling
  - Manual dexterity.

*Note.* No group differences on tests of cognitive ability and manual dexterity

# METHOD

## Narrative writing prompt:

*'Design a place for you to live....  
describe how you want your ideal  
home to look'.*

- *Wechsler Objective Language Dimensions (WOLD)*
- *No help with spelling or ideas*
- *Recorded on a digital writing tablet*



# ANALYSIS

## Product

Text Quality

Word count (wpm)

## Online processes

Execution speed = distance covered /  
time spent physically writing (excludes  
pause time)

Dear Doris  
Spelling errors

Temporal characteristics – Pauses

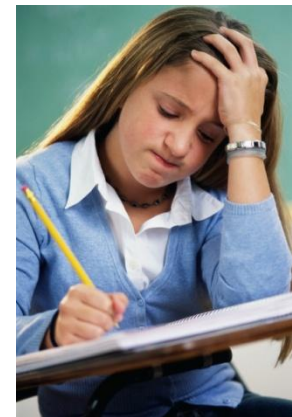
I what my house to have lady  
pink wall paper in my room, A king size  
bed with fluff pillow. I what my kitchen  
to look like this, in the middle of the  
room have a big table with leier chairs.  
and the wall paper to to be pink colour.  
a looker, with a frizer and a washer and  
a sen in the living room have a huge

# RESULTS: WRITING TASK

Product:

	Dyslexic	Age-matched	Spelling-ability
Analytic score (raw)	8.61 (2.72)	13.68 (3.20)	7.52 (1.59)
Spelling errors	15.39 (9.01)	4.87 (4.08)	12.56 (8.78)
% of text	21%	4%	39%

- In comparison to their peers, the quality of the writing produced by children with dyslexia is much lower
- They perform at a similar level to the younger SA group



# RESULTS: WRITING TASK

Productivity:

	Dyslexic	Age-matched	Spelling-ability
Words per min	8.19 (3.34)	11.48 (3.56)	5.17 (2.38)
Execution speed (cm/s)	2.11 (.69)	2.19 (.64)	1.59 (.44)
Pause time	73%	62%	73%

*Note.* Execution speed = cm/s, excluding pauses.

- Children with dyslexia can execute handwriting at the same speed as their peers
- Children with dyslexia and the SA group spent over half of the pause time around spelling errors or crossed out words



# RESULTS: CORRELATIONS

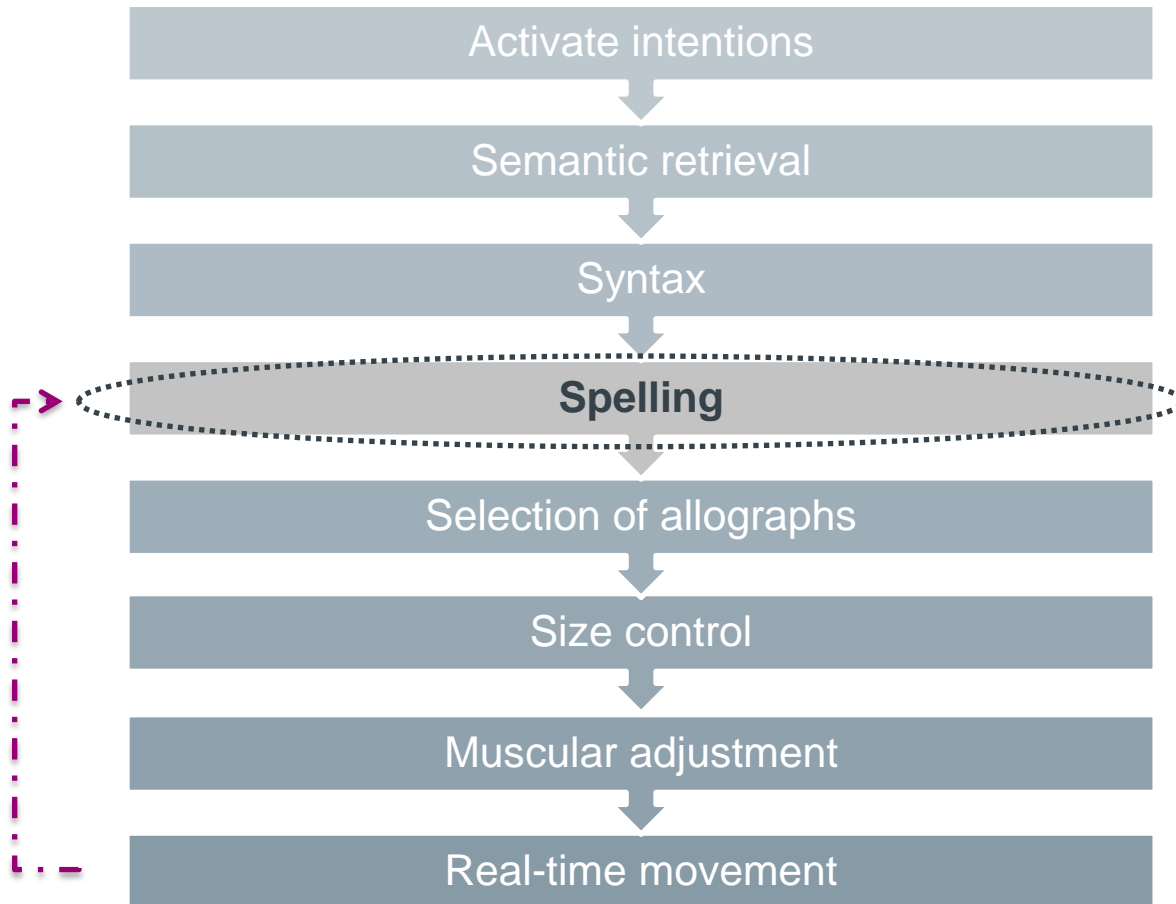
- Significant correlations showed that the more spelling errors made by children with dyslexia, the longer the pause time ( $r = .42$ ) when writing
- A significant correlation was found between pause time and words written per minute for children with dyslexia ( $r = -.62$ )
- Both spelling ( $r = -.52$ ) and pause time ( $r = -.78$ ) negatively correlated to text quality.

# SUMMARY OF RESULTS

- A detailed analysis of the composing process:
  - Argues against claims of slow handwriting by children with dyslexia
  - Rather, the fluency of transcription is frequently interrupted
  - More spelling errors in text; fewer words written
  - Handwriting production is influenced by other processes, such as spelling
  - Suggests that poor spelling is acting as a barrier to productivity.
  
- Age-comparison group supports findings of writing that is produced at speed, resulting in longer and better quality texts.

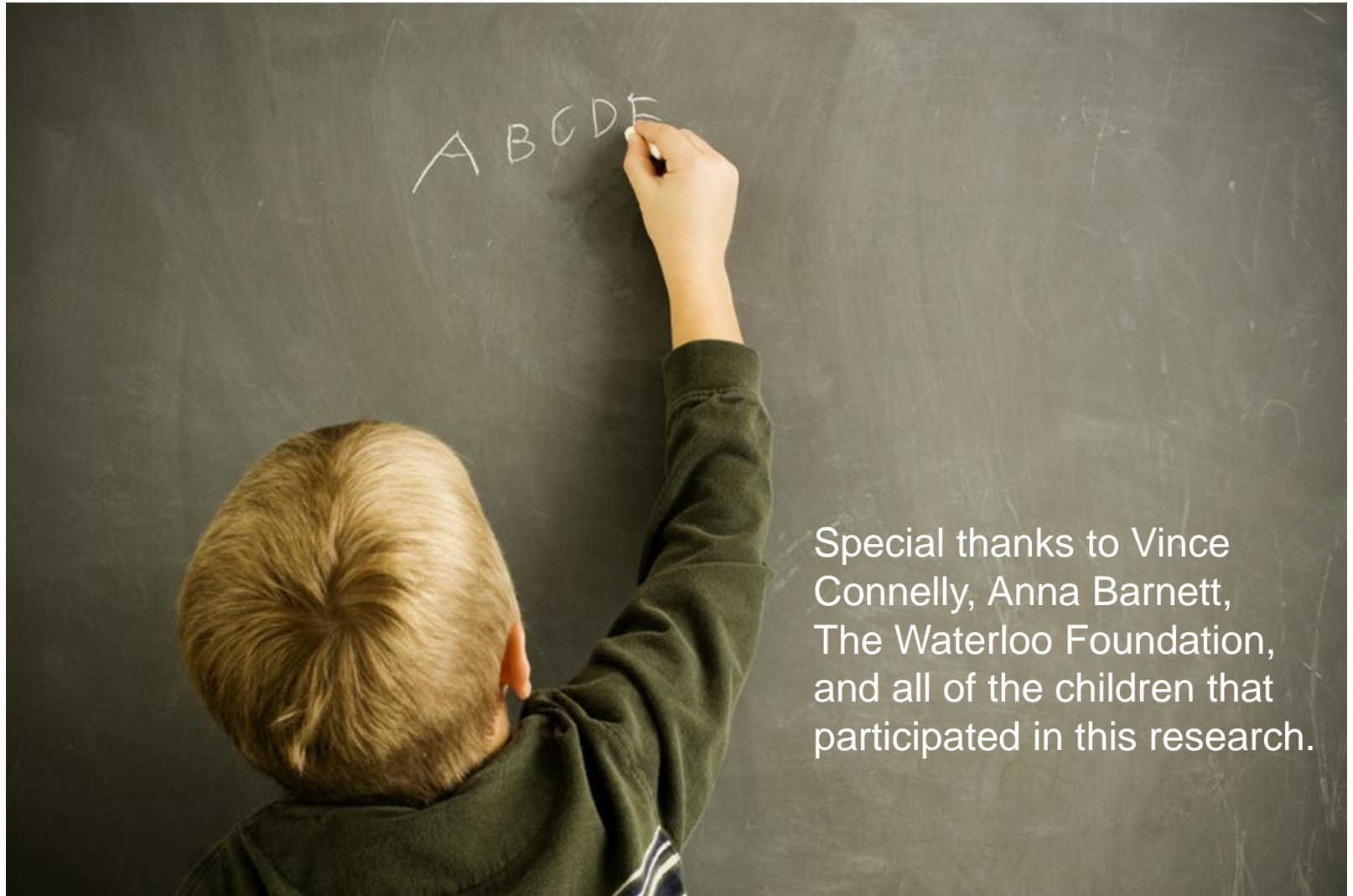
# DISCUSSION

Van Galen (1991)



# CONCLUSIONS

- Highlights the need to make spelling an ‘automatic’ skill – as well as the motor act of handwriting
- Children with writing difficulties can show similar writing behaviours to others (e.g. slowness), or to younger writers
  - However, the cause of these difficulties can differ
- Dyslexia slowness is due to poor spelling and not handwriting
- Focused interventions on spelling instruction may contribute to resolving the slow rate of composing text.



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THANK YOU FOR LISTENING