

# Using curriculum-based measurement to assess writing development

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# Plan of presentation



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1. Outline potential role for CBM in writing research
2. Consider the ways in which CBM can be linked to models of writing development
3. Examine changes overtime in CBM measures of fluency and accuracy
4. Specify the relationship(s) between CBM measures and standardised measures of writing
5. Strengths and limitations of CBM tasks



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# Background

An inability to produce sustained, accurate, and competent writing has been identified as a pervasive weakness for many children.

- US National Assessment of Educational Progress
  - » a significant proportion of fourth graders (16 percent) were below basic achievement levels
  - » 60 percent had only partial mastery of the writing process.
- The most recent published figures illustrated a similar pattern in England (37%)
- Difficulties are more pervasive when children have additional learning needs

Teachers need short, valid and reliable ways to measure progress in writing so as to identify

Children at risk

Areas of weakness – developmentally appropriate intervention

In an evidence based fashion

- Standard set of measures used to track progress by teachers to evaluate academic performance
- Initially developed to evaluate the effects of instruction (Deno, 2003)
- Provide teachers with a tool to help improve performance (Stecker et al., 2005)
- Screen for pupils who are 'at risk'
- CBM tool for screening and evaluating progress
- Majority of work on reading and mathematics

# Curriculum based measures and writing



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Some work on writing – mainly elementary school

## Measures-

- Number of words written (Shinn, 1998)
- Number of words correctly spelled
- Total punctuation and words in complete sentences most promise in association with standard tests (Gansle et al., 2004)
- Correct word sequences strong relations with essay quality (Espin, et al, 2005)

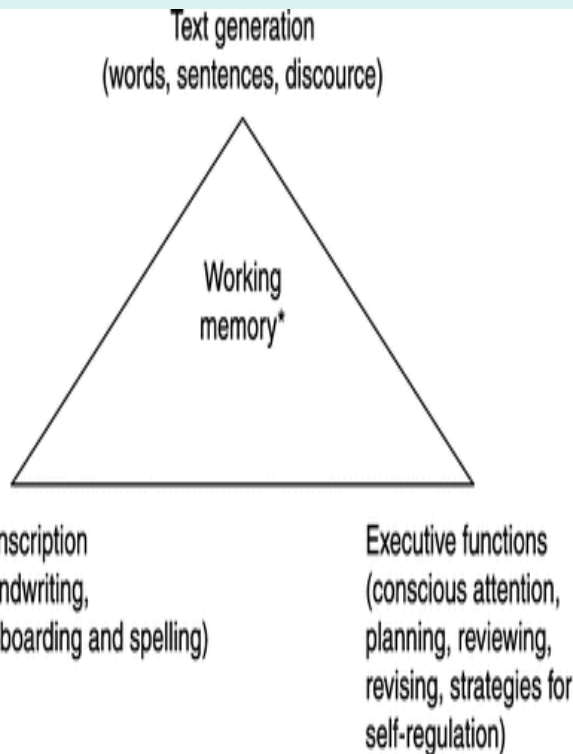
## Time

'At middle school level, a 5 min sample of written in response to a narrative story starter or a descriptive essay prompt and scored for CWS ... was found to be a valid indicator of writing performance' Espin et al., 2004

## Genre

No direct research attention in CBM tasks but written text influenced by genre (McCutchen, et al., 1997).

# Mapping measures to developmental models



Note. \*Activates long term memory during composing and short term memory during reviewing.

## Text generation

number of correct words

CWS

words in complete sentences

## Transcription

spelling

punctuation?

## Distinction

Fluency

Accuracy

# Exploratory study



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1. Influenced by time allowed to write?
2. Are CBM measures an indicator of essay quality and does it matter which measure is used?
3. Changes overtime in measures of fluency and accuracy?
  - a) Age
  - b) Genre





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# Methods

# Participants



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## Mainstream classes

Schools performing at average levels for national curriculum tests

Average SES, SEN

87 pupils

	<b>N</b>	<b>Age mean (months)</b>	<b>SD</b>	<b>Male</b>	<b>Female</b>
Year 3	30	94.8	3.6	16	14
Year 5	29	108.4	4.8	17	12
Year 5	28	119.2	3.9	16	12

## **Pupils completed**

1. Standardised writing test WOLD
2. CBM narrative prompt
  1. 3 minute assessment
  2. 5 minute assessment
3. CBM expository prompt
  1. 3 minute assessment
  2. 5 minute assessment
4. Complete assessment battery repeated after 5 months

# Prompts — derived from McCutchen (1987)



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## Examples -

### **Narrative**

One day I had the best/worst day  
ever at school

### **Expository**

There are many things that make a  
day at my school very  
interesting/boring

# Standard writing score

Overall mean = 115.26

SD= 17.04

No significant differences between  
year groups  $F(2,79)=1.24$  *ns*

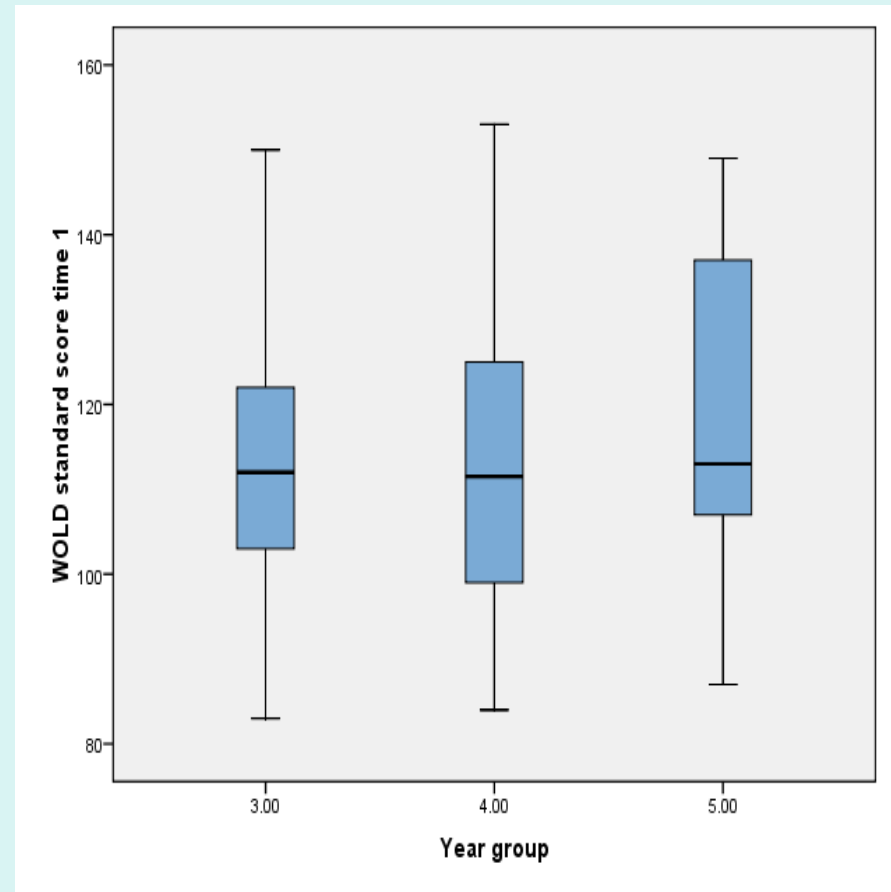
Girls scored significantly higher  
than boys  $T= -2.997$ ,  $df = 80$ ,  $p$   
 $=.004$

M Boys = 110.38 SD = 15.56

M Girls = 121.19 SD = 17.07

No significant difference over time  
standard score  
raw score

Over 5 month period the measure is  
**NOT** sensitive to change



## Variables in current analysis

### Fluency-

- a) Total words written excluding illegible and crossed out words
- b) CWS
- c) Punctuation produced
- d) Total sentences produced

### Accuracy –

- a) Proportion words spelled correctly
- b) Proportion CWS
- c) Proportion correct punctuation
- d) Words in complete sentences

## Reliability checks

Typically > .7

Some issues with  
correct capitals  
ICWS



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# Results

# Text production time

## 3 or 5 minutes



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### Fluency

1. No difference in words per minute produced
2. Significantly more
  - a) words in text
  - b) correct word sequences
  - c) correct punctuation
  - d) total sentences produced

### Accuracy (proportion scores)

- No differences in
- a) proportion words spelled correctly
  - b) proportion correct word sequences
  - c) differences in proportion of correct punctuation
  - d) Words in complete sentences

**No interaction with year group**  
**No interaction with genre**





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# How effective is CBM as a screen?

# Correlations between WOLD and writing measures



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## Fluency

Large and significant correlations for all measures

.5 for correct word sequences  
correct punctuation for narratives

Lowest total words written expository (.42) and punctuation expository (.36)

## Accuracy (proportion scores)

Large and significant correlations for words in sentences and proportion of words spelled correctly for both genres

Not proportion word sequences, correct punctuation

CBM measures work as a screen –  
particularly sensitive to measures  
relating to fluency for current cohort

# How effective does CBM measure change?

# Narrative / expository tasks – fluency



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## Words written

Year 3 < year 5; year 4 = year 5  
No main effect of time  
Writing task Narrative > Expository  
X Time, year group and genre  
Year 3 ↑ in narrative  
Year 5 ↑ in expository

## Words per minute

Year 3 = 4 ≤ year 5  
No main effect of time  
No main effect of genre  
Writing task interaction with time Narrative >  
Expository time 2

## Correct word sequences

Year 3 < year 5; year 4 = year 5  
No main effect of time  
Writing task Narrative > Expository  
X Time, year group and genre  
Year 3 ↑ in narrative  
Year 5 ↑ in narrative and expository

## Correct punctuation

No main effect year  
No main effect genre  
No main effect of time  
X Year group and genre  
Year 4 ↑ in narrative

## Total sentences

No main effect year  
No main effect genre  
No main effect of time  
X Time, year group and genre  
Year 4 ↑ in narrative  
Year 5 ↑ expository

# Narrative / expository tasks – accuracy



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## Proportion of words spelled correctly

No main effect year group  
Writing task Narrative > Expository  
No main effect of time  
No interactions

## Proportion correct punctuation

No main effect of Year, genre and time  
X Time and genre  
Narrative ↑  
Expository X

## Proportion of correct word sequences

No main effect year group  
Writing task Narrative > Expository time  
Interaction Time, genre and Year group  
Year 4 ↑ in narrative  
Year 5 ↑ in narrative and expository

## Words in correct sentences

No main effect of Year  
Significant main effect of genre Narrative > Expository  
Significant main effect of time ; Time 1 < Time 2  
No interactions with age or time

# Summary



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## **Fluency**

Age

Genre

Sensitive measures

Words written

correct word sequences

**Younger children improvement in  
narrative**

**Older narrative and expository**

## **Accuracy**

Genre

Sensitive measures

Words in complete sentences

Proportion of correct word  
sequences

# How effective are CBM gain measures in analysing standard writing scores at time 2



# Choose measures which showed changes over time

computed gain score



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## Year 3

expository gain in numbers of words (.40)

## Year 4

No significant associations

## Year 5

narrative gain in CWS (.43)

narrative gain in complete sentences (.44)

Younger children word level

Older children  
word sequence  
sentence level

# Conclusions



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## CBM

- 5 minutes is enough?
- more sensitive measure of change than standard tests
- Genre matters
- Can distinguish between fluency and accuracy measures
- Fluency measures more sensitive to development
- Taps development
  - Year 4 group (age 9) in transition from word to sentence level

## CBM

- Can work as a screening tool
- Sensitive to time but intervention?



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# Future questions



1. CBM complex procedure
  - a) Need to identify key variables
  - b) Can teachers use it to personalise learning
  
2. Increase sample size
  
3. Include sample of poorer writers
  
4. Does it really sample idea generation
  - a) Link to other cognitive competencies
  - b) Other measures of assessing text



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**THANK- YOU FOR LISTENING**