

The elusive role of phonological short-term memory in children's spelling: Effects of Key Stage, phonological awareness and letter string type

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Key Findings

- Children with good PA/LSK in both age groups, PSTM was a significant predictor of spelling accuracy for all three letter string types (regular words, irregular words and pseudowords).
- Children with poor PA/LSK, PSTM did not predict spelling accuracy for any of the letter string types.

Introduction

The inconsistency of findings regarding the association between phonological short-term memory (PSTM) and spelling in children could be due to differences in the characteristics of children in terms of phonological awareness abilities (PA) and letter-sound knowledge (LSK).

We hypothesized

- ~ that children with poor PA and LSK would rely less on sublexical processes to spell than children with good PA and LSK;
- ~ since sublexical processing draws on PSTM, the role of PSTM in spelling would also be smaller in children with poor PA and LSK.

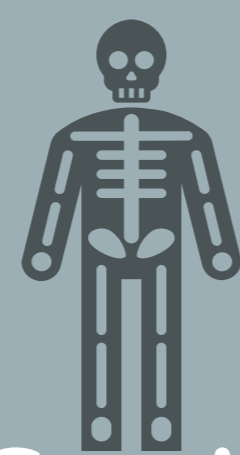
Method: Measures



Literacy-related variables

Interpretive Spelling Test (IST) regular words, irregular words and pseudowords

Letter sound knowledge (LEST)



Cognitive correlates

Phonological awareness (spoonerisms, segmentation - PIPA)

Nonword repetition (CTOPP)

Method: Participants

7 Primary schools in the UK a mix of rural and urban

Sample of schools	Type	Size	Ofsted	%FSM	Pupil:Teacher Ratio
School 1	Rural	197	Good	1.5	20.3
School 2	Urban	595	Good	8.9	31.3

Yr R	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
62	104	143	76	89	64	103

Sample - Means

	F/Key stage 1			Key stage 2		
	Poor PA+LK N=65 F= 30	Good PA+LK N=65 F=30	t-test	Poor PA+LK N=43 F=20	Good PA+LK N=43 F=20	t-test
age	6.5 (.99)	6.5 (.85)	ns	9.1 (1.02)	9.1 (1.1)	ns
IST irregular	4.03 (4.5)	4.8 (5.5)	ns	14.5 (9.1)	20.1 (8.3)	P=.004
IST regular	11.3 (8.1)	14.2 (8.8)	P=.05	21.9 (7.8)	27.02(6.5)	P=.002
IST pseudowords	9.56 (6.8)	12.4 (.6)	P=.03	18.4 (7.3)	21.4 (5.9)	P=.03

Poor PA+LK <85 SS ; Children did not differ in PSTM

Results-Regression

	F/Key stage 1						Key stage 2					
	Poor PA+LK			Good PA+LK			Poor PA+LK			Good PA+LK		
	Ir Wds	Rg Wds	Pseud	Ir Wds	Rg Wds	Pseud	Ir Wds	Rg Wds	Pseud	Ir Wds	Rg Wds	Pseud
Year	2.3	3.9	4.02	3.1	4.5	4.03	4.2	3.2	2.6	.61	.03	-.22
PSTM	1.4	1.2	.85	2.2	2.4	2.7	.16	.57	1.7	3.5	3.8	2.7

Significant associations in bold.

Results – Qualitative analyses of errors

	Key Stage 1		
	Poor PA/LSK	Good PA/LSK	T test p_value
Irregular word LD	3.7 (1.4)	3.4 (1.4)	Ns
Regular word LD	2.5 (1.8)	1.7 (1.5)	P=.02
Pseudoword LD	2.8 (1.8)	2 (1.4)	P=.01
Irregular word PD	2.6 (1.1)	2.3 (1.1)	Ns
Regular word PD	2.1 (1.5)	1.5 (1.3)	P=.03
Pseudoword PD	2.5 (1.5)	1.9 (1.2)	P=.01

	Key Stage 2		
	Poor PA/LSK	Good PA/LSK	T test p_value
Irregular word LD	1.8 (1.1)	1.2 (.81)	P=.003
Regular word LD	.97 (.80)	.51 (.44)	P=.002
Pseudoword LD	1.22 (.93)	.86 (.51)	P=.03
Irregular word PD	1.42 (.72)	1 (.61)	P=.01
Regular word PD	.90 (.64)	.53 (.42)	P=.003
Pseudoword PD	1.29 (.78)	.97 (.54)	P=.03

Conclusions

- PSTM is a significant predictor of spelling accuracy only for the children with good PA and LSK.
- Analyses of the children's misspellings show that for children with poor PA and LSK, errors are more distant phonologically and orthographically from the actual word in comparison to children with good PA and LSK.
- According to the authors, these results suggest that the use of PSTM for spelling may be limited to children with good PA and LSK.

