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

<table>
<thead>
<tr>
<th>Sample of schools</th>
<th>Type</th>
<th>Size</th>
<th>Ofsted</th>
<th>% PSTM</th>
<th>Pupil:Teacher Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>School 1</td>
<td>Rural</td>
<td>197</td>
<td>Good</td>
<td>1.5</td>
<td>20.3</td>
</tr>
<tr>
<td>School 2</td>
<td>Urban</td>
<td>595</td>
<td>Good</td>
<td>8.9</td>
<td>31.3</td>
</tr>
</tbody>
</table>

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

Results - Regression

<table>
<thead>
<tr>
<th>F</th>
<th>Key stage 1</th>
<th>Key stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor PA+LK</td>
<td>Good PA+LK</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>age</td>
<td>6.3 (99)</td>
<td>6.5 (85)</td>
</tr>
<tr>
<td>IST irregular</td>
<td>4.03 (4.5)</td>
<td>4.8 (5.5)</td>
</tr>
<tr>
<td>IST regular</td>
<td>1.1 (8.1)</td>
<td>1.2 (8.8)</td>
</tr>
<tr>
<td>IST pseudowords</td>
<td>9.56 (68)</td>
<td>12.4 (66)</td>
</tr>
</tbody>
</table>

Significant associations in bold.

Results – Qualitative analyses of errors

Key Stage 1

<table>
<thead>
<tr>
<th></th>
<th>Poor PA/LSK</th>
<th>Good PA/LSK</th>
<th>T test</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irregular word LD</td>
<td>3.7 (1.4)</td>
<td>3.4 (1.4)</td>
<td>Na</td>
<td></td>
</tr>
<tr>
<td>Regular word LD</td>
<td>2.5 (1.8)</td>
<td>1.7 (1.5)</td>
<td>P=0.02</td>
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</tr>
<tr>
<td>Pseudoword LD</td>
<td>2.8 (1.8)</td>
<td>2.1 (1.4)</td>
<td>P=0.01</td>
<td></td>
</tr>
<tr>
<td>Irregular word PD</td>
<td>2.6 (1.1)</td>
<td>2.3 (1.1)</td>
<td>Na</td>
<td></td>
</tr>
<tr>
<td>Regular word PD</td>
<td>2.1 (1.5)</td>
<td>1.5 (1.3)</td>
<td>P=0.03</td>
<td></td>
</tr>
<tr>
<td>Pseudoword PD</td>
<td>2.5 (1.5)</td>
<td>1.9 (1.2)</td>
<td>P=0.01</td>
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</tr>
</tbody>
</table>

Key Stage 2

<table>
<thead>
<tr>
<th></th>
<th>Poor PA/LSK</th>
<th>Good PA/LSK</th>
<th>T test</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irregular word LD</td>
<td>1.8 (1.1)</td>
<td>1.2 (1.8)</td>
<td>P=0.003</td>
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<tr>
<td>Regular word LD</td>
<td>9.7 (80)</td>
<td>51 (44)</td>
<td>P=0.002</td>
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<tr>
<td>Pseudoword LD</td>
<td>1.22 (93)</td>
<td>86 (51)</td>
<td>P=0.03</td>
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</tr>
<tr>
<td>Irregular word PD</td>
<td>1.42 (72)</td>
<td>1.61</td>
<td>P=0.01</td>
<td></td>
</tr>
<tr>
<td>Regular word PD</td>
<td>90 (64)</td>
<td>53 (42)</td>
<td>P=0.003</td>
<td></td>
</tr>
<tr>
<td>Pseudoword PD</td>
<td>1.29 (78)</td>
<td>97 (54)</td>
<td>P=0.03</td>
<td></td>
</tr>
</tbody>
</table>

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.