Phonics and sight word training in children with dyslexia

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NHMRC 488518 ARC DP0879556
evidence-based model of word reading

developmental dyslexia

controlled trial that compares phonics and sight word training in children with dyslexia

implications for testing poor readers

implications for teaching poor readers

regular words ...

see word

letter processing

letters>sounds /b/ /oo/ /t/ × /p/ /u/ /b/

spoken word planning

speak word /boot/ × /fruit/

/BOOT

BOOT × 8007 PDDL TOOB
irregular words ...

- SOOK
- 'sook'

```
see word
letter processing
```

```
BOOK
BOOK× 8007 PDLL TOOB
```

```
written word rep
```

```
meaning
```

```
letters>sounds /b/ /oo/ /k/
```

```
spoken word rep
spoken word planning
```

```
'sook'
'book'
'book'
```

```
/speak word/
```

```
/s/book/
```

```
```
to read regular and irregular words you need...

two reading routes

“sight word” and “phonics”

engaged at the same time

that work equally well
but sometimes they don’t …

some good at sight word reading (lexical)

but bad at sight word reading (lexical) = surface dyslexia

many bad at sight word reading (lexical)

but bad at phonics reading (nonlexical) = phonological dyslexia

some good at phonics reading (nonlexical)

and bad at phonics reading (nonlexical) = mixed dyslexia

see word

letter processing

written word rep

meaning

spoken word rep

letters > sounds

spoken word planning

spoken word rep

spoke word

but bad at phonics reading (nonlexical)
Some studies have tested the effect of training the phonics route (via phonics).

A very few studies have tested the effect of training the sight word route (via irregular words).

Need two different types of training...

No (known) studies have tested the effect of training the phonics route in the order of letters > sounds.

No (known) studies have trained the effect of training phonics reading and sight word reading in the same group of children with dyslexia.

Meaning

Written word rep

Spoken word rep

Spoken word planning

See word

Letter processing

Speak word
does 16 weeks of sight word training plus phonics training have a significant effect on the sight word or phonics routes of poor readers?

does the order of sight word and phonics training matter?

does 8 weeks of sight word training, phonics training, or mixed training have a significant effect on the sight word or phonics routes of poor readers?

does the type of training matter?
study design …

<table>
<thead>
<tr>
<th></th>
<th>Phonics+sight word (N = 36)</th>
<th>Sight-word+phonics (N=36)</th>
<th>Mixed+mixed (N = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test 1</strong></td>
<td>Screening measures</td>
<td>Screening measures</td>
<td>Screening measures</td>
</tr>
<tr>
<td>2-3 hours</td>
<td>Outcome measures</td>
<td>Outcome measures</td>
<td>Outcome measures</td>
</tr>
<tr>
<td><strong>Test-retest</strong></td>
<td>No training</td>
<td>No training</td>
<td>No training</td>
</tr>
<tr>
<td>8 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test 2</strong></td>
<td>Outcome measures</td>
<td>Outcome measures</td>
<td>Outcome measures</td>
</tr>
<tr>
<td>2-3 hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Train 1</strong></td>
<td>Phonics</td>
<td>Sight-words</td>
<td>Mixed</td>
</tr>
<tr>
<td>8 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test 3</strong></td>
<td>Outcome measures</td>
<td>Outcome measures</td>
<td>Outcome measures</td>
</tr>
<tr>
<td>2-3 hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Train 2</strong></td>
<td>Sight-words</td>
<td>Phonics</td>
<td>Mixed</td>
</tr>
<tr>
<td>8 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Test 4</strong></td>
<td>Outcome measures</td>
<td>Outcome measures</td>
<td>Outcome measures</td>
</tr>
<tr>
<td>2-3 hours</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
sight word training (8 w, 5 d/w, 30 m/d) …

step 1:
list of 24 irregular words on flashcards (30 lists)

vacht
correct

pint
incorrect

friend
incorrect

step 3:
incorrect words from step 1 and 2

if 0 or 1 wrong then next list next day
phonics training (8 w, 5 d/w, 30 m/d) …

irregular words removed
sentences removed
paragraphs removed

short vowels
long vowels
digraphs
suffixes
mixed training (8 w, 5 d/w, 30 m/d) …

day 1

pint

yacht

day 2

LEXIA Strategies for Older Students

Our World Begins with Reading

pint

yacht

day 3

LEXIA Strategies for Older Students

Our World Begins with Reading

day 4…
general reading measures ...

- trained irregular words
- untrained irregular words
- experimental lists

- sight word reading

- meaning

- written word rep

- spoken word rep

- spoken word planning

- speak word

- word reading fluency

- reading comprehension

- letter processing

- letters>sounds

- phonics reading

- nonword accuracy
- nonword fluency

- CC2 word reading test
- TOWRE nonwords

- TOWRE word
- TERC
groups before training …

<table>
<thead>
<tr>
<th>General</th>
<th>Phonics+ sight words</th>
<th>Sight words+ phonics</th>
<th>Mixed+mixed (m-m)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>9.42/1.71</td>
<td>9.19/1.64</td>
<td>9.21/1.67</td>
<td>ns</td>
</tr>
<tr>
<td>Non-verbal IQ (ss)</td>
<td>97.5/14.16</td>
<td>95.56/17.12</td>
<td>101.12/14.25</td>
<td>ns</td>
</tr>
<tr>
<td>Repeating sentences (ss)</td>
<td>7.14/2.97</td>
<td>8.44/2.55</td>
<td>8.41/3.33</td>
<td>ns</td>
</tr>
<tr>
<td>Irregular word (z)</td>
<td>-1.31/0.67</td>
<td>-1.38/0.64</td>
<td>-1.26/0.58</td>
<td>ns</td>
</tr>
<tr>
<td>Nonwords (z)</td>
<td>-1.50/0.57</td>
<td>-1.27/0.54</td>
<td>-1.32/0.53</td>
<td>ns</td>
</tr>
<tr>
<td>Regular words (z)</td>
<td>-1.41/0.57</td>
<td>-1.29/0.59</td>
<td>-1.30/0.59</td>
<td>ns</td>
</tr>
</tbody>
</table>
example ...

difference raw score

raw score = true treatment effect

= ANCOVA test retest

phonics + sight words

mixed
questions ...

does 16 weeks of sight word training plus phonics training have a significant effect on the sight word or phonics routes of poor readers?

does the order of sight word and phonics training matter?

does 8 weeks of sight word training, phonics training, or mixed training have a significant effect on the sight word or phonics routes of poor readers?

does the type of training matter?
trained irregular words …

* true treatment effect
* ANCOVA group
untrained irregular words …
nonword reading accuracy …
nonword reading fluency …
word reading fluency …

![Graph showing data points for different treatment effects]

- t1t2    t1t3    t1t4       t1t2    t1t3   t1t4       t1t2    t1t3     t1t4
- phonics+sight   sight words+phonics   mixed+mixed

* true treatment effect
reading comprehension ...
questions …

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does the type of training matter?
16 weeks phonics and sight word training
Order matters
8 weeks of phonics, sight word, mixed training
Type matters
questions …

does 16 weeks of sight word training plus phonics training have a significant effect on the sight word or phonics routes of poor readers?

  yes

does the order of sight word and phonics training matter?

  yes for untrained irregular words

does 8 weeks of sight word training, phonics training, or mixed training have a significant effect on the sight word or phonics routes of poor readers?

  yes

does the type of training matter?

  yes for trained irregular words
clinical implications for testing…

test phonics reading accuracy e.g., nonword reading test
  Castles & Coltheart 2 (CC2) word reading test

test irregular word reading accuracy e.g., irregular word reading test
  Castles & Coltheart 2 (CC2) word reading test

test word reading fluency
  Test of Word Reading Efficiency (Torgesen)

test reading comprehension
  Test of Everyday Reading Comprehension (screener)
Welcome to MOTIF

Welcome to the Macquarie Online Test Interface (MOTIF), an online platform for the administration and scoring of cognitive tests.

You can administer these tests online to one or more people and the results will be stored in your own private and secure test page. Alternatively, you can download hardcopies of the test materials and administer the tests offline.

We hope you find this tool useful.

Tests

CC2
The Castles and Colliard 2 (CC2) tests different processes in single-word reading.

TERC
The Test of Everyday Comprehension tests how well a person understands everyday reading tasks.

DISTs
The Diagnostic Spelling Test for Sounds (DISTs) tests if a person can represent sounds in English with the correct letters.

DISTn
The Diagnostic Spelling Test for Nonwords (DISTn) tests how well a person knows the sound-letter rules in English.

DISTI
The Diagnostic Spelling Test for Irregular Words (DISTI) tests how well a person can spell irregular words.
clinical implications for teaching …

teach phonics

teach irregular words (phonics can’t do it all)

teach phonics before irregular words (better for untaught irregular words)

irregular words will not destroy phonics skills

use computers to support the teaching of poor readers
why are computers important ... ?
Australia and Europe Area size comparison

- Darwin to Perth: 4,396 km
- Perth to Adelaide: 2,707 km
- Adelaide to Melbourne: 726 km
- Melbourne to Sydney: 887 km
- Sydney to Brisbane: 972 km
- Brisbane to Cairns: 1,748 km
evidence-based model of word reading

developmental dyslexia

controlled trial that compares phonics and sight word training in children with dyslexia

implications for testing poor readers

implications for teaching poor readers
thank you