Morphological intervention for children with reading and spelling difficulties

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Team Morph

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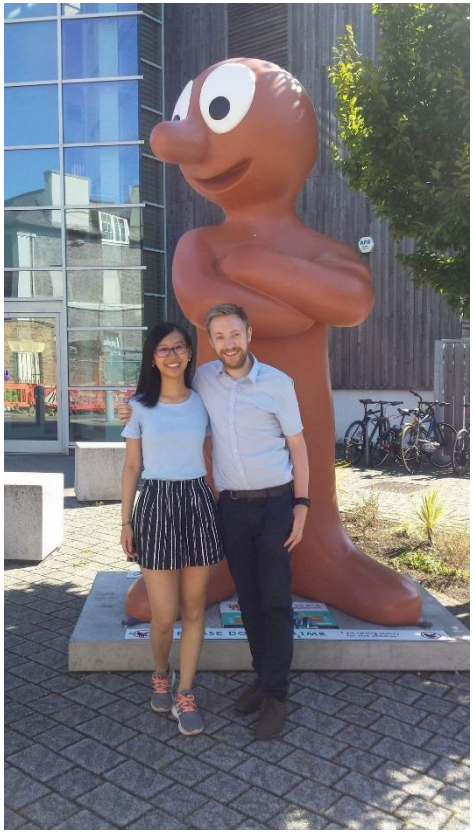


The context

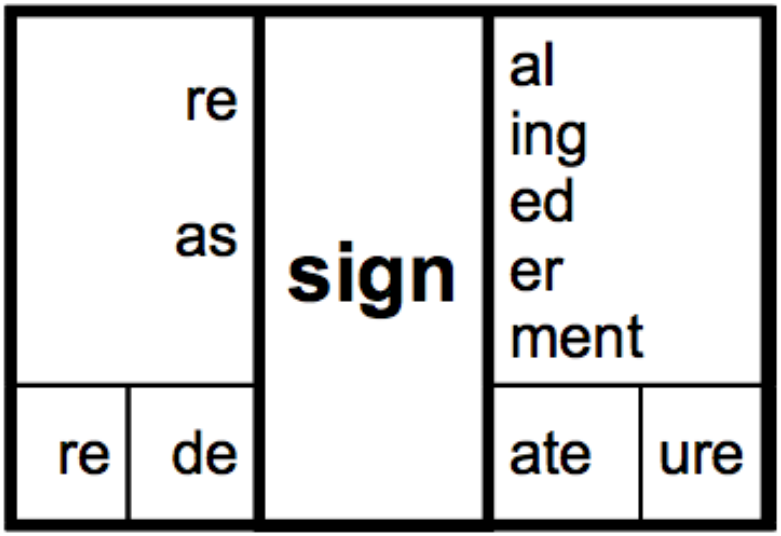
- In the UK, initial reading instruction consists of:
  - systematic phonics instruction
  - practice reading books
  - listening to and discussing written texts beyond their reading ability
- Some children struggle to learn to read and spell despite this
- What can we do for these children?

sign

sign

signature

signal



Latin root: *signare*

"To mark with a stamp or sign"

Existing studies of morphological instruction

- Evidence for improvements in reading, spelling and vocabulary *(e.g. Bowers & Kirby, 2010; Devonshire, Morris & Fluck, 2013; Nunes, Bryant & Olsson, 2009; Goodwin & Anh, 2010, 2013)*
- Frequency, length and method of morphological instruction varies widely
- Some evidence morphological instruction is more beneficial for poor readers, but confounded with group size *(e.g. Bowers, Kirby, & Deacon, 2010)*

The MORPH Project

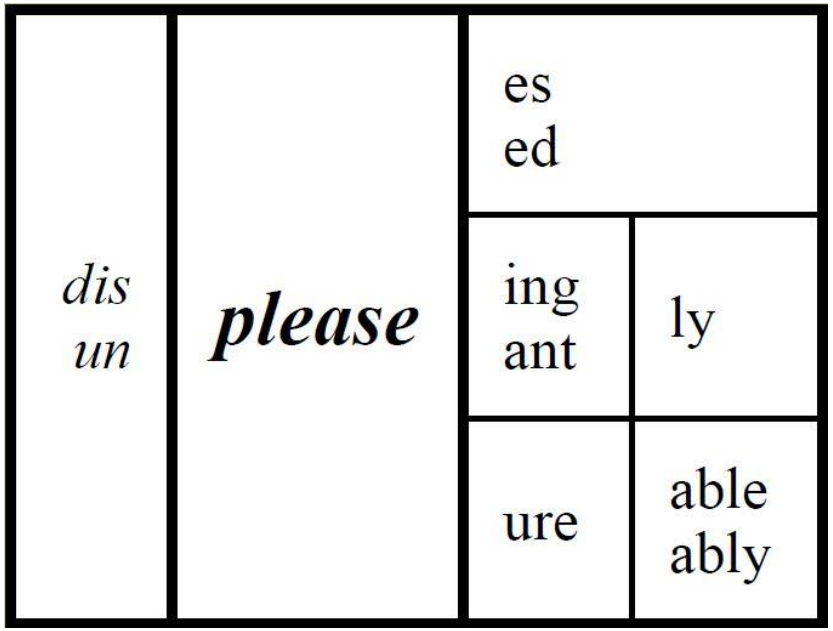
- A randomised controlled trial registered on the Open Science Framework: https://osf.io/zfc2n/
- Comparison of two training programmes:
  - Structured Word Inquiry (Bowers & Kirby, 2010)
  - Motivated Reading

Intervention sessions

- 24 weeks of instruction
- Three 20-min sessions per week
- Delivered by teaching assistants
  - Four day training workshop
  - Scripted lessons
  - Fortnightly school visits by research team

Structured Word Inquiry

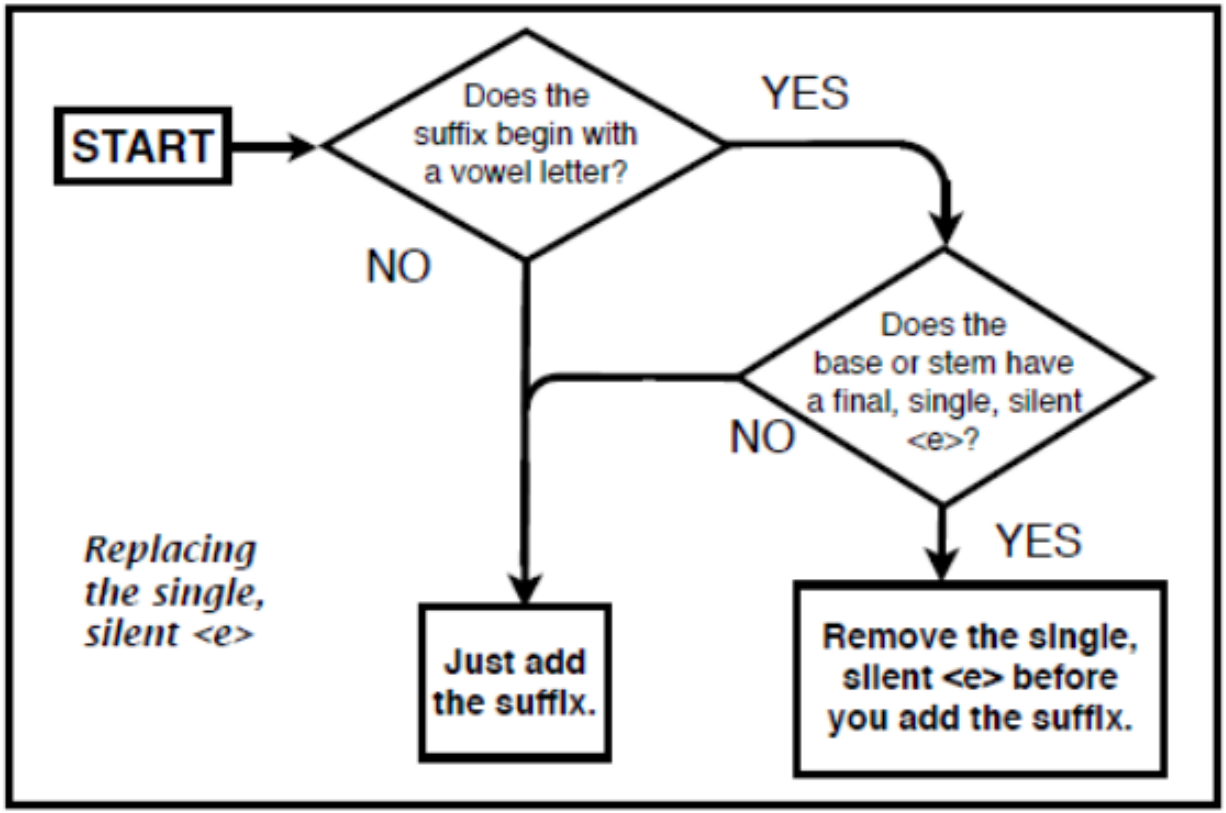
Word matrices and word sums



please + ant -> pleasant
dis + please + ure -> displeasure

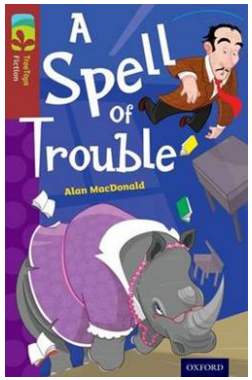
Flowcharts

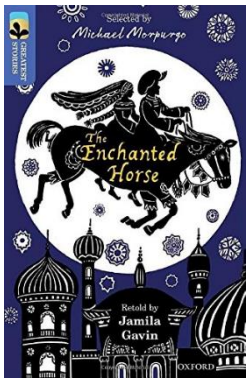
*please + ed -> pleaseed

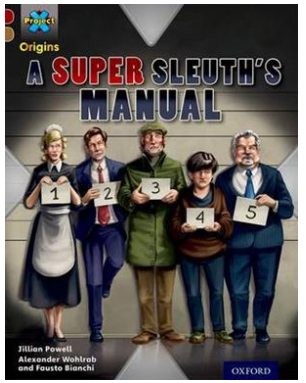


Motivated Reading

- Based on successful intervention for children with reading comprehension difficulties (Clarke, Snowling, Truelove & Hulme, 2010)
- Developed in conjunction with Paula Clarke
- Books donated by Oxford University Press







Motivated Reading Lessons

Two lesson per week of Reciprocal Teaching (Palincsar & Brown,1984)

- Children select a text to read
- TA reads aloud
- Group re-reads text slowly, applying strategies
    - clarification
    - summarisation
    - prediction
    - question generation

Motivated Reading Lessons

One vocabulary lesson per week

- Robust Vocabulary Instruction (Beck, McKeown & Kucan, 2002)
- 2-3 words per lesson
    - multiple exposures to words in rich contexts
    - Tier 2 words (gradual, enthusiasm, glimpse)
    - children had opportunity to choose words

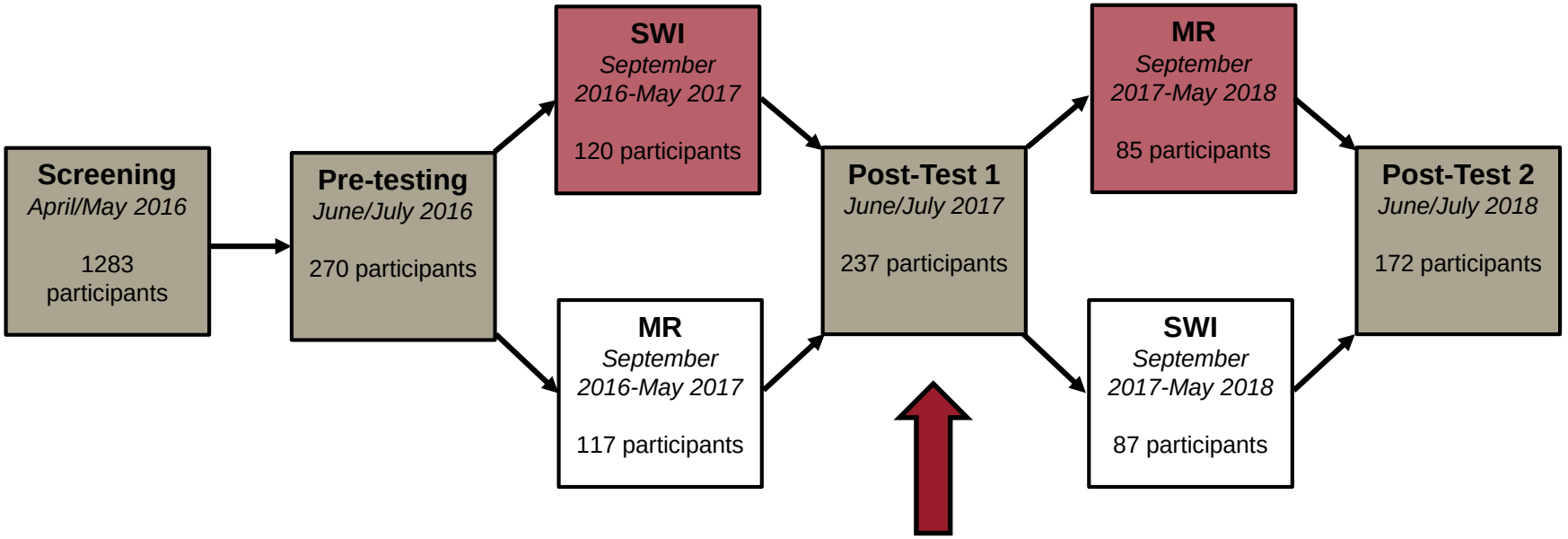
SWI vs MR

- Same amount of time and attention
- Same TAs teaching both programmes
- Same set of words trained across programmes
- MR provides reading experience and exposure to new words at the **lexical** level, without instruction in word structure
- Comparison tests effectiveness of teaching **sub-lexical morphological knowledge**

Research Questions

- Is Structured Word Inquiry more effective than Motivated Reading for children with poor reading and spelling skills?
- Does the effectiveness of each programme vary depending on
  - age?
  - severity of reading and spelling difficulties?
  - whether or not children are native speakers of English?

Study design



SWI = Structured Word Inquiry
MR = Motivated Reading

Training participant characteristics

- Children were in Year 3 and 5 (ages 8-10)
- Schools from a mix of inner city, suburban and semi-rural locations

YEAR 2	SWI	MR
Mean age*	8;3	8;4
%EAL	40	40
%FSM	31	34
YEAR 4	**SWI**	**MR**
Mean age*	9;3	9;4
%EAL	41	46
%FSM	33	43

*September 2016

Outcome measures

Skill	Measures
Reading	• Trained and untrained words • TOWRE[1]
Spelling	• Trained and untrained words • Nonword morphological spelling (MoSTn)[2]
Reading comprehension	• NGRT[3]
Vocabulary	• Trained and untrained words • Group-administered BPVS[4]
Morphological awareness	• Analogy task[5]
Motivation to read	• Questionnaire[6]

1. Torgesen, Wagner & Rashotte, 1999; 2. Kohnen, Colenbrander, Caruana and Barisic (unpublished);
3. GL Assessment, 2010; 4. Dunn, Dunn & Styles, 2009; 5. Adapted from Nunes et al., (1997), Deacon & Kirby (2004);
6. Adapted from Malloy, Marinak, Gambrell & Mazzoni (2013)

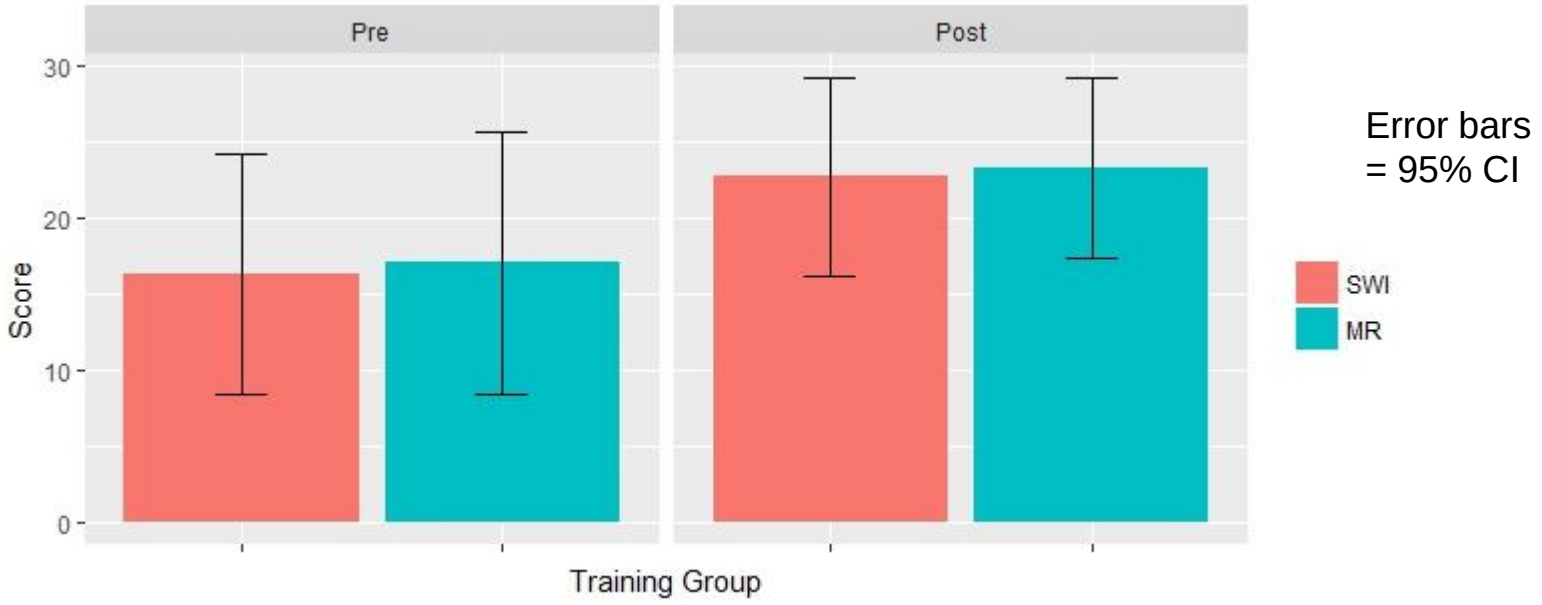
Analysis

- Regression models comparing groups with random intercepts to allow for baseline differences between schools
- Pre-test scores used as a covariate
- Interaction terms for
  - age
  - initial reading/spelling ability
  - whether or not children are native speakers of English

Morphological reading task

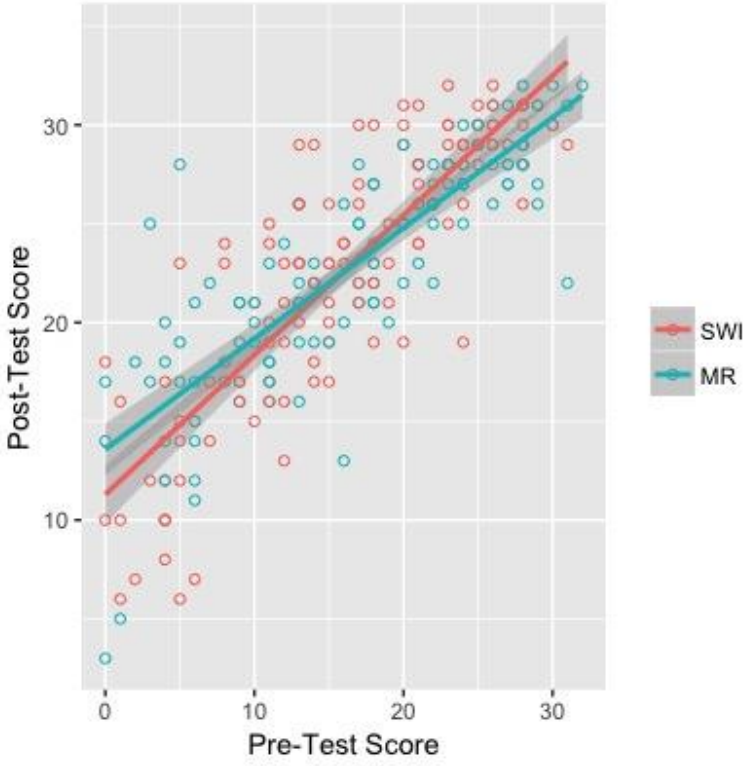
- Children asked to read aloud
  - real words, taught during training lessons e.g. *assistance*
  - words of similar length and frequency that had not been trained
  - nonwords made up of trained bases and suffixes e.g. *helpability*

Morphological reading task



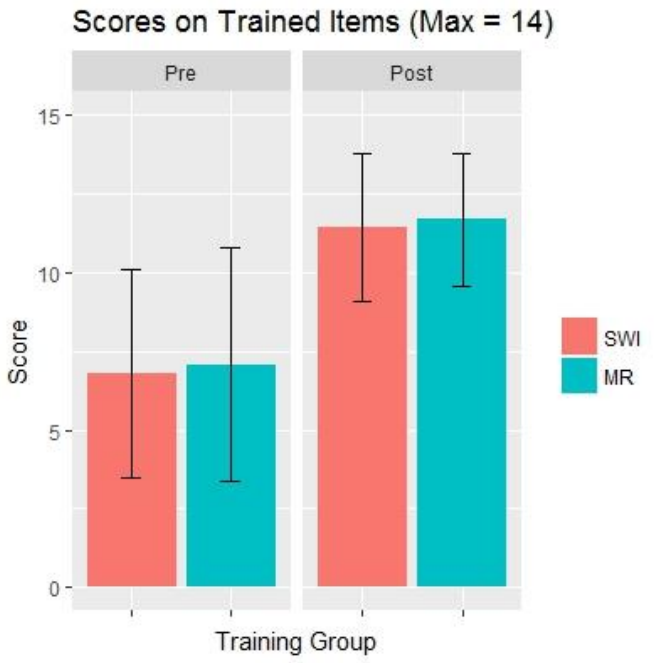
- Main effect of group (t = 2.13, p = 0.03)
- No main effects of age or EAL

Morphological reading task



Interaction of pre-test score and group (t=-2.41, p = 0.02)

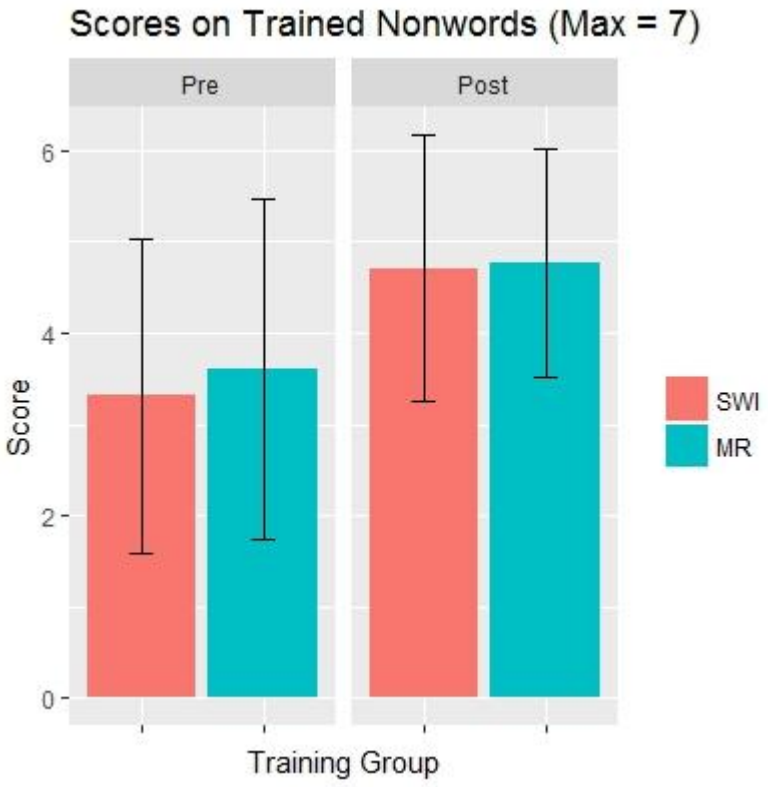
Trained vs. untrained items



Error bars = 95% CI

Evidence of improvement on trained but not untrained items

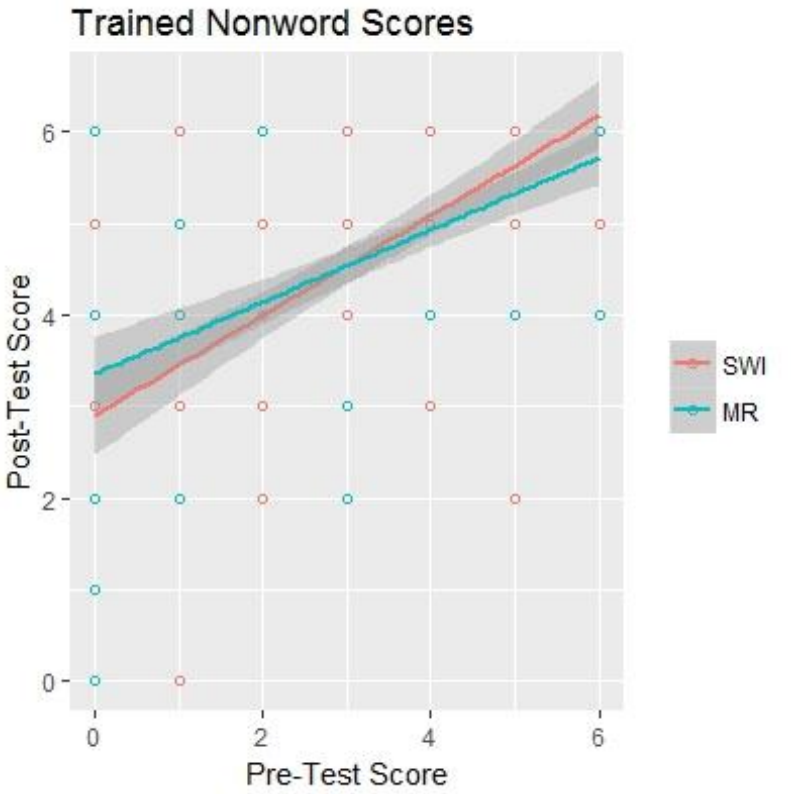
Generalisation items



Error bars
= 95% CI

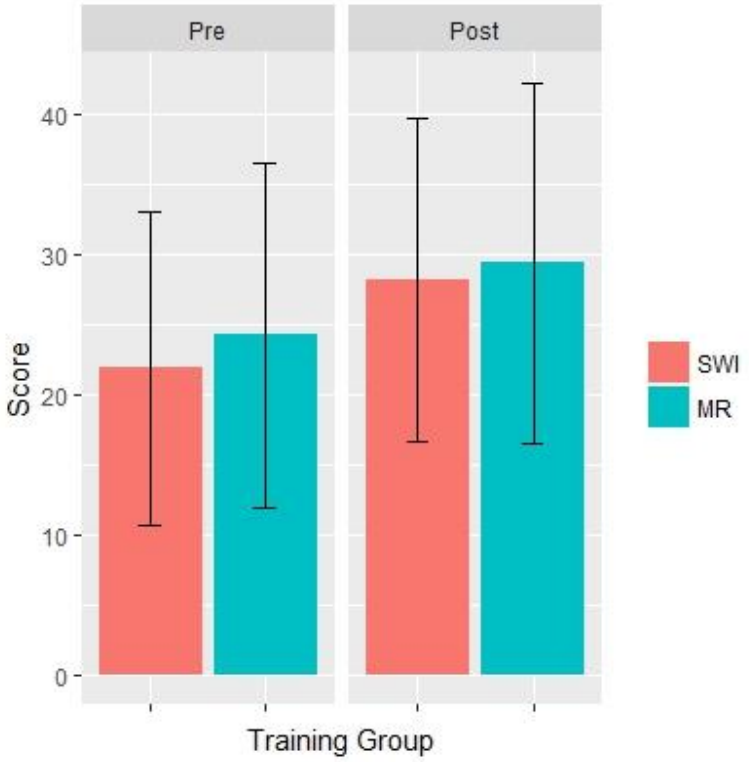
Evidence of improvement on novel combinations of trained bases and suffixes

Generalisation items



Same interaction as on trained items (t = -2.08, p = 0.04)

TOWRE Pseudoword Decoding



Error bars
= 95% CI

Main effect of pre-test (t=-15.40, p < 0.001)
but no other significant main effects or interactions

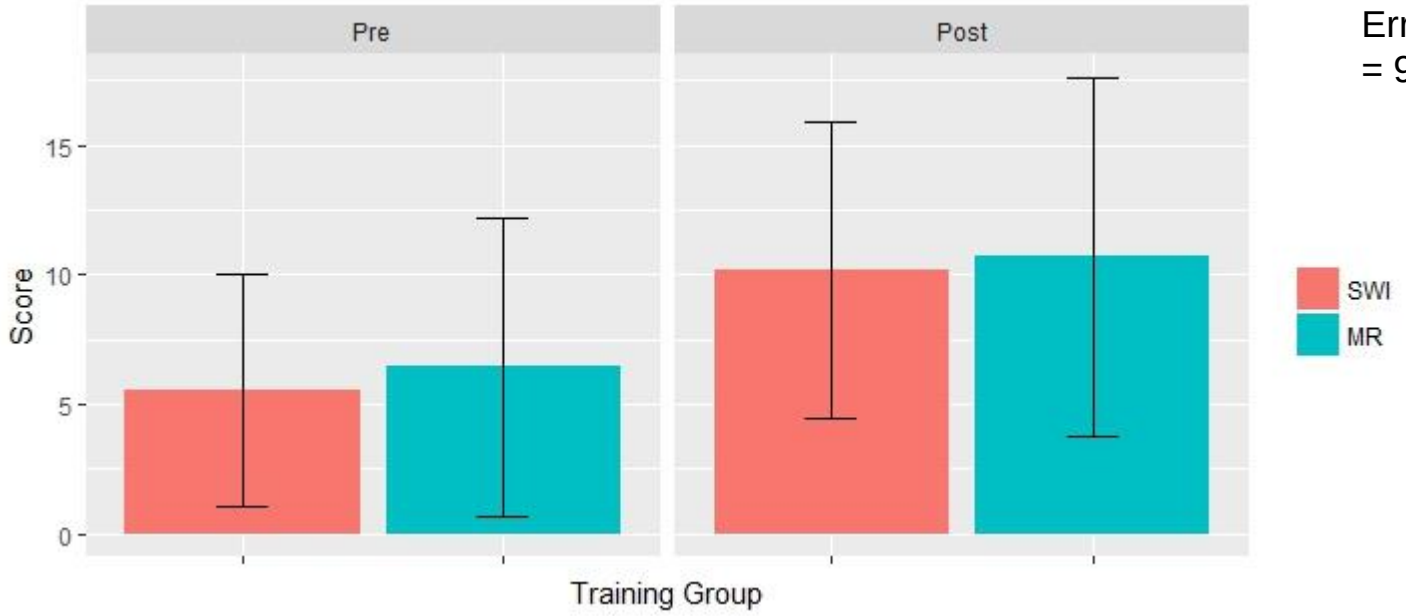
Reading - Overview

- For children with lower pre-test scores, Motivated Reading resulted in greater gains than Structured Word Inquiry, and vice versa
- Reading improved on trained items and nonwords made up of trained morphemes for both groups
- Reading did not improve on untrained words or nonwords

Morphological spelling task

- Children asked to spell to dictation
  - real words, taught during training lessons e.g. *unpleasant*
  - words of similar length and frequency that have not been trained
  - nonwords made up of trained bases and suffixes e.g. *preplease*

Morphological spelling task



Error bars
= 95% CI

Main effect of pre-test (t=12.22, p < 0.001)

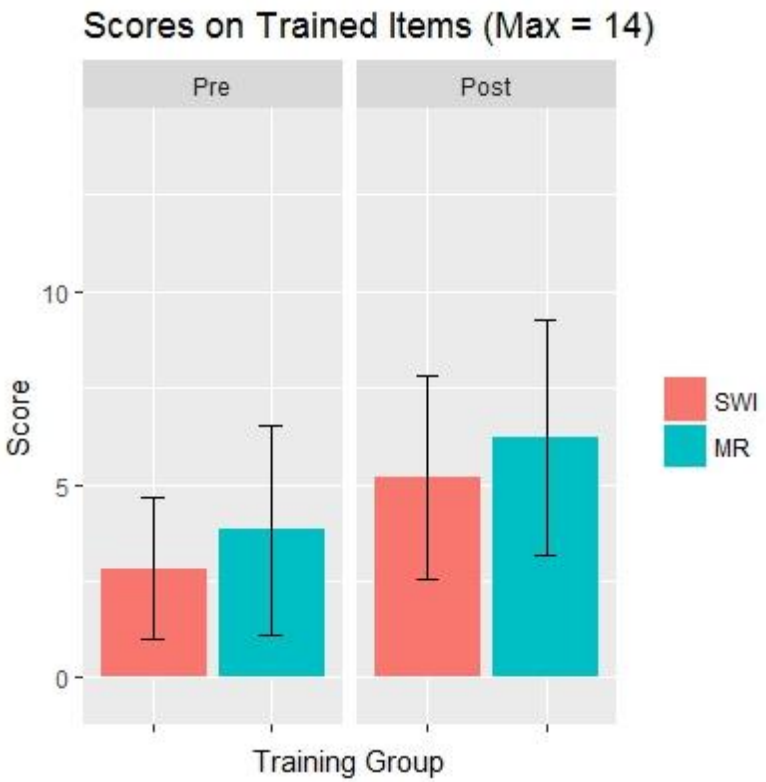
but no other significant main effects or interactions

Trained vs. untrained items

Error bars = 95% CI

- Untrained items: interaction between group and year was significant (t = 2.2, p = 0.03)
- Trained items: interaction between group and year approached significance (t = 1.83, p = 0.07)

Year 5 Spelling



Error bars = 95% CI

Year 3 Spelling

Error bars = 95% CI

MoSTn spelling task

- Children asked to spell nonwords ending in common suffixes e.g.

  Gary will snive. He will be the sniver. Spell sniver.

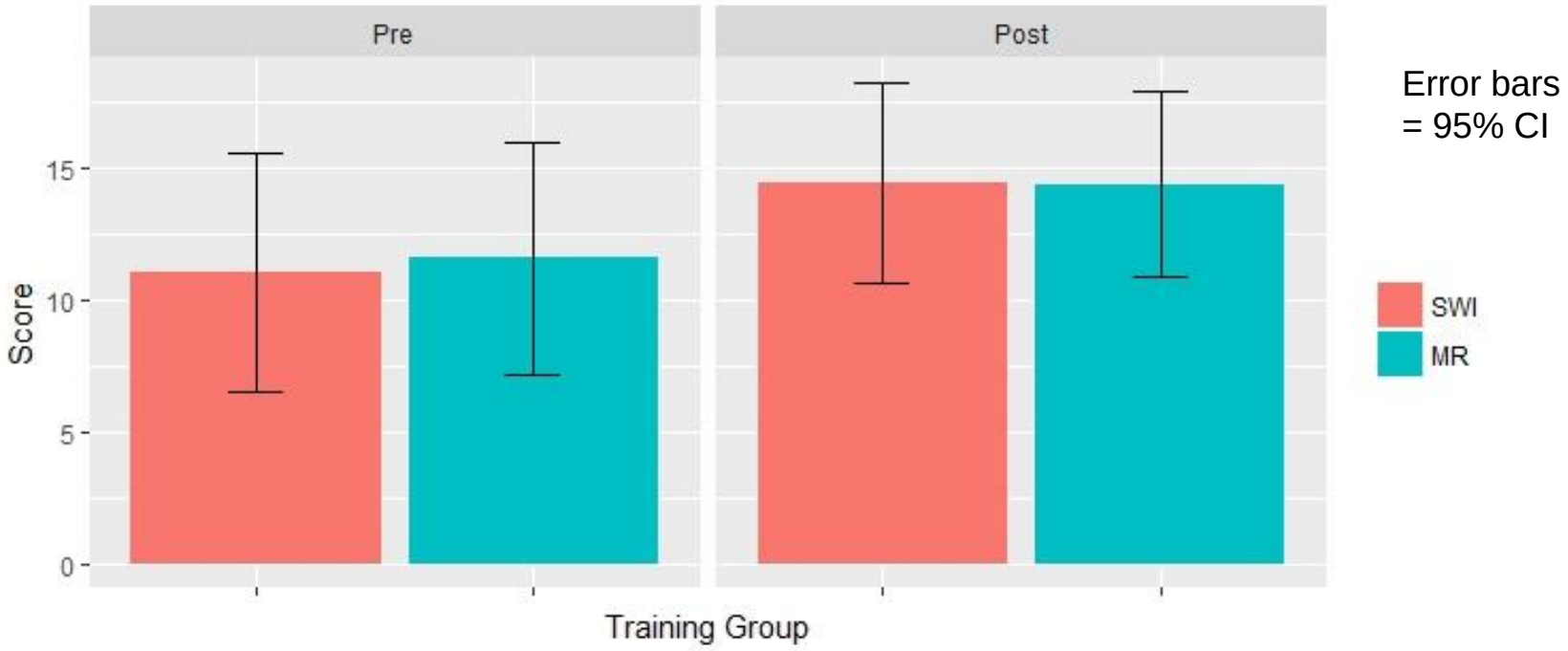
- Two scores:

  1) **base score** - whether children spelled the base correctly (e.g. *sniver*)

  2) **suffix score** - whether children spelled the suffix correctly (e.g. *sniver)*

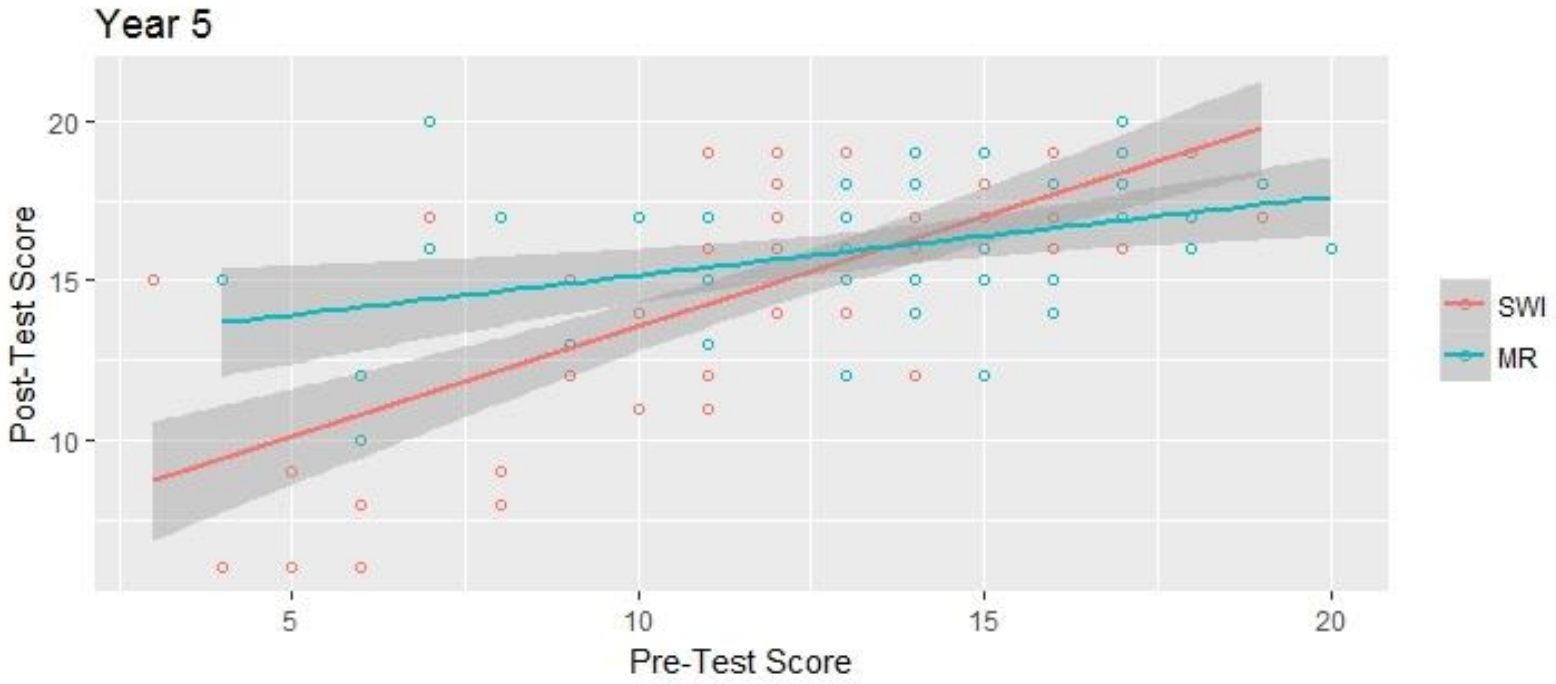
Kohnen, Colenbrander, Caruana and Barisic (unpublished)

MoSTn – Suffix Score



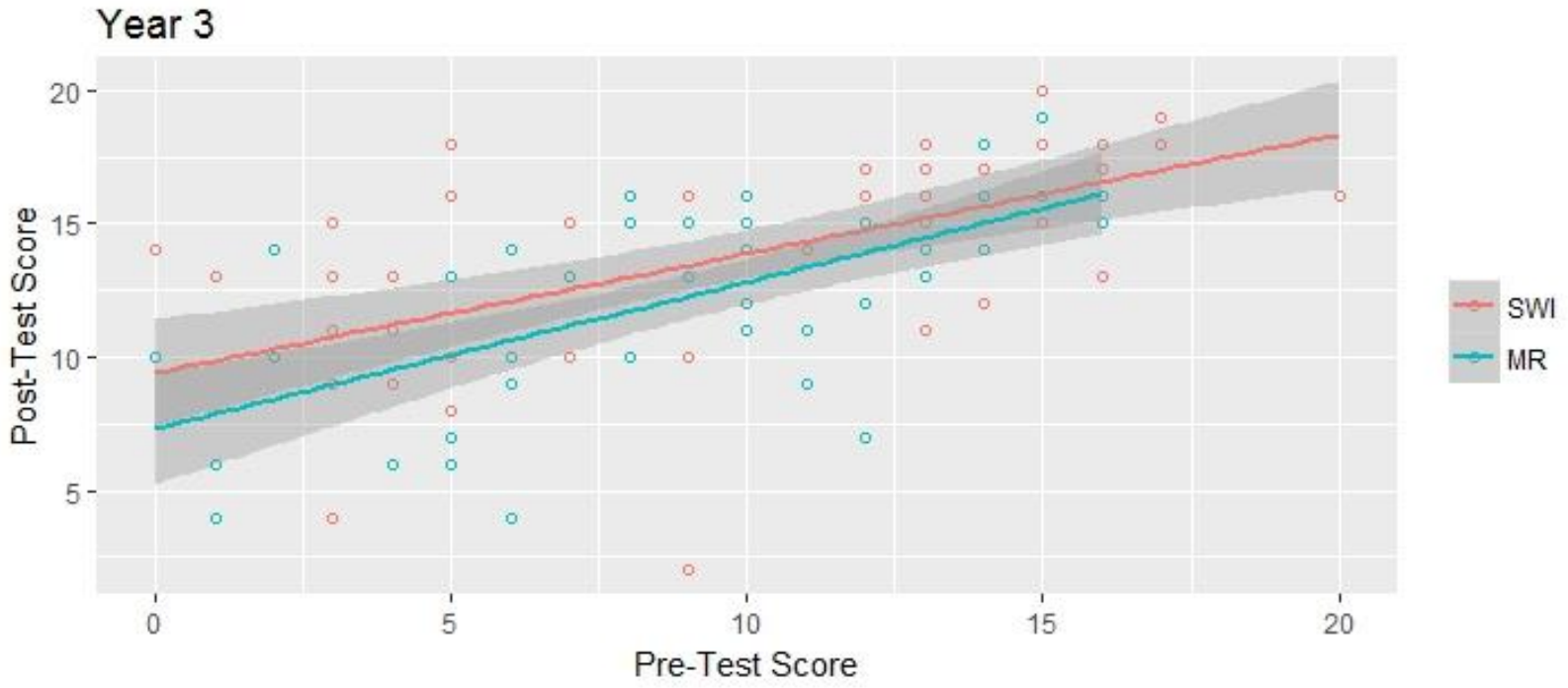
No significant main effects of group but significant interaction of year and training group (t = 2.10, p = 0.04)

MoSTn – Suffix Score
Year 5



Same pattern as that observed on reading measure

MoSTn – Suffix Score
Year 3



Difference between SWI and MR approached significance (t = -1.69, p = 0.09)

Spelling - overview

- Scores increased on both trained and untrained real words and nonwords in both year groups
- Not clear whether this was a result of training, or of normal classroom instruction/maturation
- Hint of greater improvements in SWI than MR in Year 3 – but not significant
- Probably because some of the trained morphemes were taught in class as part of the Year 3-4 spelling and grammar curriculum

Other outcome measures

- No significant differences between the groups on
  - Reading comprehension
  - Group-administered multiple choice vocabulary
  - Oral morphological awareness
  - Motivation to Read questionnaire

Research Questions

- Is Structured Word Inquiry more effective than Motivated Reading for children with poor reading and spelling skills?

  No
- Does the effectiveness of each programme vary depending on
  - age? **No – except for spelling?**
  - severity of reading and spelling difficulties? **Yes**
  - whether or not children are native speakers of English? **No**

Fidelity

- Fidelity ratings from school visits
  - SWI: Mean 3.28, SD 0.53
  - MR: Mean 3.43, SD 0.47
  - Difference not significant (p = 0.07)
- 19 of 28 TAs completed a fidelity rating scale
- 9 TAs completed qualitative interviews
  - SWI more challenging to deliver
  - TAs felt less confident delivering SWI
  - Felt that SWI was more challenging for children to learn, particularly for youngest and weakest readers

Conclusions

- No evidence that SWI is more effective than MR for improving reading, spelling, vocabulary or reading comprehension
- MR instruction led to greater reading gains than SWI for the weakest readers (also true for Year 5 spelling)
- Possible that SWI instruction was too high-level
- Lower levels of TA knowledge and confidence in SWI may have reduced effectiveness
- Future studies could explore effects of increasing TA training and tailoring to ability levels

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