Evaluation of Early Reading Intervention Knowledge (ERIK)

John Munro
The literacy learning profile for each student

What international research says reading comprehension looks like

Two dimensions of reading comprehension

Simple View of Reading (Gough & Tunmer, 1985) can guide understanding reading comprehension:

\[
\text{Reading comprehension} = \text{Decoding} \times \text{Oral language comprehension}
\]

phonics, decoding fluency,  
Listening comprehension
This relationship can progressed through various iterations and is still seen internationally as important in unpacking reading comprehension:

\[ RC = D \times OL \times SE \times MC \times CV \]

- word reading skills
- Oral language knowledge
- Self efficacy, identity as a reader
- Metacognition as a reader, ability to manage reading activity
- Cultural valuing of reading as a skill, its use beyond school

Our literacy learning profile needed to target these aspects.
Modified simple view of reading elaborated by text processing theories

\[ RC = D \times OL \times SE \times MC \times CV \]

- Word reading skills
- Phonological, phonemic skills
- Paragraph or discourse meanings
- Topic meanings
- Sentence meanings
- Vocabulary
- Purpose for communicating; identity as reader
- Self talk to guide thinking
- Success as a reader gained from feedback
Identifying the reading profiles using Neale

<table>
<thead>
<tr>
<th>YOS</th>
<th>accuracy</th>
<th>comprehension</th>
<th>rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>&lt;15</td>
<td>&lt;6</td>
<td>&lt;22</td>
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<td>3</td>
<td>&lt;33</td>
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<td>4</td>
<td>&lt;41</td>
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<tr>
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<td>&lt;47</td>
<td>&lt;18</td>
<td>&lt;57</td>
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<tr>
<td>6</td>
<td>&lt;57</td>
<td>&lt;21</td>
<td>&lt;65</td>
</tr>
</tbody>
</table>

Those who underachieved
1. in all domains of reading
2. in accuracy + comprehension
3. in accuracy + rate
4. in comprehension + rate
5. in accuracy only
6. in comprehension only
7. in rate only
8. in none of the domains; they scored above the 25th % in all domains.
The three intervention pathways

**Phonological awareness pathway.**
Each session teaches a spoken onset and/or rime unit through various phonological and phonemic skills (rhyming, blending and segmenting) and using these to read and spell words and to read prose.

**Orthographic processing pathway.**
Each session teaches a letter cluster, either a written rime or a written onset for one syllable words.

It teaches word reading skills (segmenting and blending to read written words) and using these in reading and writing activities.

**Oral language pathway.**
Each session teaches a comprehending strategy first in oral language contexts and then applied to reading.

The teaching sequence:
- inferring the topic of the text and questions it might answer;
- visualizing sentences and paraphrasing sentences.
The structure of each session

Each session comprised the following types of learning activities: students

• recall what they learnt from earlier session by re-reading text from the previous session.

• learn pathway- specific skills (rhyming, sound blending and spoken word segmenting skills in the phonological pathway, segmenting and blending written words using phonic strategies in the orthographic pathway and application of comprehension strategies in the comprehension pathway).

• read and write target words.

• read relevant prose.

• review explicitly what has been learnt in the session.

Every fifth session: review session.

Re-administer prose and isolated word reading tasks, word reading skills for text similar to those used on intervention teaching and build students’ reading self-efficacy.
The criteria used to allocate to an intervention

<table>
<thead>
<tr>
<th>Year 1 (post RR) and Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 16&lt;sup&gt;th&lt;/sup&gt; %ile in accuracy &amp; comprehension or below 25&lt;sup&gt;th&lt;/sup&gt; %ile in accuracy &amp; low in the phonological tasks</td>
</tr>
<tr>
<td><strong>Phonological pathway.</strong></td>
</tr>
<tr>
<td>15-25th %ile accuracy and low in both phonological and orthographic tasks (if not an ESL student)</td>
</tr>
<tr>
<td><strong>Orthographic pathway.</strong></td>
</tr>
<tr>
<td>Below 25th %ile accuracy &amp; low in orthographic tasks or below 25%ile in comprehension</td>
</tr>
<tr>
<td><strong>Oral language pathway.</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Year 1 (post RR) and Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 15th %ile in accuracy and low on the phonological tasks or an ESL student or below 15th %ile in both accuracy and comprehension</td>
</tr>
<tr>
<td><strong>Phonological pathway.</strong></td>
</tr>
<tr>
<td>Slow processing speed, decoding and reading rate, poor RAN &amp; average scores on phonological tasks or below the 15th %ile in accuracy and low orthographic score</td>
</tr>
<tr>
<td><strong>Orthographic pathway.</strong></td>
</tr>
<tr>
<td>Below 15th %ile in comprehension but not in accuracy</td>
</tr>
<tr>
<td><strong>Oral language pathway.</strong></td>
</tr>
</tbody>
</table>
The number of students comprising each profile in each intervention at each year level

<table>
<thead>
<tr>
<th></th>
<th>Phonological</th>
<th>Orthographic</th>
<th>Language</th>
<th>Phonological + orthographic</th>
<th>Orthographic + language</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Second year of schooling</strong></td>
<td></td>
<td></td>
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<tr>
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<td>17</td>
<td>13</td>
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<tr>
<td>under on accuracy + rate</td>
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<tr>
<td>Total</td>
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<td>88</td>
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<td>Total</td>
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<td>41</td>
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<td>under on rate</td>
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<tr>
<td>above on all</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4</td>
<td>8</td>
<td>7</td>
<td></td>
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</tr>
</tbody>
</table>
A literacy learning profile was compiled for each student. This comprised their performance in a number of areas necessary for successful early literacy learning:

- phonological and phonemic skills and phonological short term memory,
- ability to make verbal analogies,
- ability to learn an orthographic code and to display visual symbolic and orthographic processing,
- ability to match spoken and written words and to use read pseudo words,
- their listening comprehension and
- their RAN of letters and digits.
The design of the evaluation

The centrality of the reading profile in this evaluation

A student’s reading performance and their capacity to learn more about reading is assumed to be a synthesis of their knowledge and skill in the three domains of reading.

The efficacy of ERIK is investigated in terms of these profiles.

<table>
<thead>
<tr>
<th></th>
<th>Comprehension</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All n=1072</td>
<td>profile 1 n=442</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.58**</td>
<td>.77**</td>
</tr>
<tr>
<td>Comprehension</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The design of the evaluation

The centrality of the Simple View of Reading

The Simple View of Reading was used to underpin the intervention pathways. Are data aligned with this?

\[ RC = D \times OL \]

In our data: Neale comp score pre teach = Neale accur raw score pre teaching x s verbal analogies?

The correlations between reading comprehension and product of these two skills for each profile in all domains of reading

<table>
<thead>
<tr>
<th></th>
<th>Correlation</th>
<th>n</th>
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</thead>
<tbody>
<tr>
<td>in all domains of reading</td>
<td>0.42∗∗</td>
<td>377</td>
</tr>
<tr>
<td>in accuracy + comprehension</td>
<td>0.44∗∗</td>
<td>174</td>
</tr>
<tr>
<td>in accuracy + rate</td>
<td>0.50∗∗</td>
<td>39</td>
</tr>
<tr>
<td>in comprehension + rate</td>
<td>0.24</td>
<td>32</td>
</tr>
<tr>
<td>in accuracy only</td>
<td>0.47</td>
<td>17</td>
</tr>
<tr>
<td>in comprehension only</td>
<td>0.52∗∗</td>
<td>33</td>
</tr>
<tr>
<td>in rate only</td>
<td>0.36</td>
<td>19</td>
</tr>
<tr>
<td>in none of the domains</td>
<td>0.37*,</td>
<td>44</td>
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</table>

The student data are consistent with the main causes of underachievement in reading comprehension predicted by SVR. SVR accounted for 20 - 25% of variance in reading comprehension for the profiles covering 91% of the cohort.
To investigate whether the interventions worked:

Were there improvements?

Was the extent of improvement affected by:

- the number of years of schooling
- the number of lessons per week a student had
- the total number of lessons a student had
- the student’s reading profile
- the intervention pathway a student was allocated to

Accuracy scores:

pre teaching

post teaching
To investigate whether the interventions worked

The evaluation uses a general linear modeling repeated measures ANOVA design.

The comparison of pre- and post reading raw score was the within subjects factor.

The between subject effects
- reading profiles (8)
- intervention pathways (3),
- number of years of schooling (5),
- Delivery aspects (total number of lessons and the number of lessons per week).

Only 9 students had complete sets of data. The number of lessons per week omitted from some analysis.

To compare the efficacy of the three interventions: oneway ANOVA, ANCOVA with pre-intervention reading comprehension score the covariate and comparison of gains at each year level.

To compare improvement for each learning profile in each intervention at each year level: ANOVA, analysis of gain scores and effect sizes (Cohen’s d) and comparison with mean gain.

To compare total number of lessons and the lesson frequency per week for each intervention at each year level: ANOVA

To identify the aspects of literacy learning profile are associated with reading gain: use linear regression.
Three comments re the design

How to compare pre- and post intervention outcomes? Gain scores or use of repeated measures analysis of variance?

How to calculate and interpret Cohen's $d$ effect size to compare post and pre-intervention means? Cohen recommended against blanket interpretation ("canned effect sizes"). Interpret using additional statistics.

Some of the reading profile cohorts of reading profiles at some of the year levels had very few students. This limited the statistical procedures that could be used. Where $n < 10$, use $t$-tests only.

<table>
<thead>
<tr>
<th>Cohen's $d$</th>
<th>Cohen's post above (%)</th>
<th>proportion (%) of the groups that overlap</th>
<th>probability of higher post teaching score</th>
</tr>
</thead>
<tbody>
<tr>
<td>.2</td>
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<td>92</td>
<td>56</td>
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<td>.3</td>
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</tr>
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<td>.4</td>
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<td>.5</td>
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<td>3.0</td>
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Pre teaching differences in accuracy for each intervention

Preteaching reading accuracy scores

<table>
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<th>Accuracy</th>
<th>phon</th>
<th>orth</th>
<th>lang</th>
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<tbody>
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<td>0</td>
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<td>50</td>
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</tbody>
</table>

- Year 3 lang had higher letter sound decoding and orthographic processing scores than phon.
- Year 3 orth had higher verbal analogies scores than phon.
- Year 5 orth had higher RAN for letters and names than phon.

lang higher than phon or orth
Pre-teaching differences in accuracy for each intervention

- Lowest for the profiles in which students underachieved on all measures of reading or in comprehension and accuracy.
- Highest for the cohorts in which students underachieved only in rate and in which they didn’t underachieve on any measures.
- This difference was significant for all interventions from years 2 to 5.
- Profiles 1 and 2 often lower than profiles 3-6.
- These data support the use of the reading profiles as the unit of analysis in the evaluation of the efficacy of the intervention.
Improvement in Neale accuracy raw scores

How did each of the main factors affect the improvement in reading accuracy for the student group as a whole?

The teaching improved reading accuracy. This was influenced by the number of years of schooling and students’ reading profiles.

The intervention pathways did not differ in their influence on the improvement regardless of the number of years of schooling. The rate of improvement did not differ across the interventions.

Students’ reading profile influenced their level of improvement. The extent of improvement for different reading profiles was not influenced by the intervention pathway selected. This effect changed with years of schooling.

Neither the total number of lessons nor the number of lessons per week directly affected accuracy. The effect is complex. It depends on the intervention pathway selected and the reading profile.

Given the complex relationship between the variables, we need to examine their effect on accuracy separately, at each year level.
Improvement in reading accuracy for students in the second year of school

Improvement for each intervention pathway

![Graph showing improvement for each intervention pathway at Year 2](image)

- **Improvement for each intervention at Year 2**
  - Largest gain: 2.15
  - Smallest gain: 1.17
  - Pre vs. post comparison:
    - Phon: 1.28
    - Ortho: 2.15
    - Lang: 1.17
Improvement in reading accuracy for students in the second year of school

Improvement for each reading profile in the phonological pathway

Change in accuracy for each reading profile in the phonological intervention

<table>
<thead>
<tr>
<th>Reading Profile</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>under on all measures</td>
<td>2.55</td>
<td></td>
</tr>
<tr>
<td>under on accuracy +comprehension</td>
<td>2.13</td>
<td></td>
</tr>
<tr>
<td>under on accuracy +rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>under on accuracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>above on all</td>
<td></td>
<td>0.84</td>
</tr>
</tbody>
</table>

- Improvement in reading accuracy for students in the second year of school.
- Improvement for each reading profile in the phonological pathway.
- Change in accuracy for each reading profile in the phonological intervention.
- Pre: 2.55, Post: 2.13, Improvement: 0.84.
Improvement in reading accuracy for students in the second year of school

Improvement for each reading profile in the orthographic pathway

Change in accuracy for each reading profile in the orthographic intervention

<table>
<thead>
<tr>
<th>Reading Profile</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under on all measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under on accuracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under on comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under on rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above on all</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Change in accuracy: 3.03
Improvement in reading accuracy for students in the second year of school

Improvement for each reading profile in the language pathway

Change in accuracy for each reading profile in the language intervention

Under on accuracy + comprehension
Under on comprehension
Above on all

Accuracy

0
5
10
15
20
25
30
35
40

Pre
Post

1.16
1.00
Improvement in reading accuracy for students in the third year of school

Improvement for each intervention pathway

Improvement in accuracy for each intervention at Year 3

Accumulation of accuracy for each intervention pathway:
- **1.42** for phon
- **1.32** for orth
- **0.86** for lang

Intervention: pre | post

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>phon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>orth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lang</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Improvement in reading accuracy for students in the third year of school

Improvement for each reading profile in the phonological pathway

![Graph showing improvement in reading accuracy for students in the third year of school. The graph illustrates the improvement for each reading profile in the phonological pathway. The accuracy is measured in units, and the improvement is shown from pre to post.]
Improvement in reading accuracy for students in the third year of school

Improvement for each reading profile in the orthographic pathway

![Graph showing reading accuracy improvement for different profiles](image)

- 1.66 under on all measures
- 1.67 under on comprehension + accuracy
- 1.45 under on comprehension + rate

Graph legend:
- **pre**
- **post**

Reading profile:
- under on all measures
- under on comprehension + accuracy
- under on comprehension + rate
- under on comprehension
- under on rate
- above on all
Improvement in reading accuracy for students in the third year of school

Improvement for each reading profile in the oral language pathway

<table>
<thead>
<tr>
<th>Reading Profile</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under on all measures</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>Under on comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ accuracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under on comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under on comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ rate</td>
<td>1.49</td>
<td>1.03</td>
</tr>
<tr>
<td>Under on rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above on all</td>
<td>1.50</td>
<td>0.41</td>
</tr>
</tbody>
</table>
Improvement in reading accuracy for students in the fourth year of school

Improvement for each intervention pathway

改善每个干预途径的准确性

图示显示了在四年级时，每个干预途径的改善情况。
Improvement in reading accuracy for students in the fourth year of school

Improvement for each reading profile in the phonological pathway

Change in accuracy for each reading profile in the phonological intervention

![Graph showing change in accuracy for each reading profile in the phonological intervention.](image)
Improvement in reading accuracy for students in the fourth year of school

Improvement for each reading profile in the orthographic pathway

Change in accuracy for each reading profile in the orthographic intervention

<table>
<thead>
<tr>
<th>Reading Profile</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>under on all measures</td>
<td>1.23</td>
<td></td>
</tr>
<tr>
<td>under on comprehension + accuracy</td>
<td>2.04</td>
<td></td>
</tr>
<tr>
<td>under on accuracy + rate</td>
<td>2.69</td>
<td></td>
</tr>
<tr>
<td>under on accuracy</td>
<td>1.61</td>
<td></td>
</tr>
<tr>
<td>above on all</td>
<td>2.01</td>
<td></td>
</tr>
</tbody>
</table>
Improvement in reading accuracy for students in the fourth year of school

Improvement for each reading profile in the language pathway

Change in accuracy for each profile in the language intervention

- under on all measures: 1.07
- under on comprehension + accuracy: 1.69
- under on accuracy + rate: 2.24
- under on comprehension + rate: 2.20
- under on comprehension: 1.22
- under on rate: 0.55
- above on all: 1.10
Improvement in reading accuracy for students in the fifth year of school

Improvement for each intervention pathway

Improvement in comprehension for each intervention at Year 5

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>phon</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>orth</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>lang</td>
<td></td>
<td>1.04</td>
</tr>
</tbody>
</table>

Accuracy vs. Intervention: phon, orth, lang

Pre vs. Post comparison for each intervention.
Improvement in reading accuracy for students in the fifth year of school

Improvement for each reading profile in the phonological pathway

Change in accuracy for each profile in the phonological intervention

![Graph showing improvement in reading accuracy for students in the fifth year of school. The graph illustrates the change in accuracy for each profile in the phonological intervention, with data points indicating improvements under on all measures and under on comprehension + accuracy.]
Improvement in reading accuracy for students in the fifth year of school

Improvement for each reading profile in the orthographic pathway

Change in accuracy for each profile in the orthographic intervention

- under on all measures
- under on accuracy +comprehension
- under on accuracy +rate

Accuracy values:
- 0.99
- 1.03
- 1.02
Improvement in reading accuracy for students in the fifth year of school

Improvement for each reading profile in the language pathway

Change in accuracy with reading profile in the language intervention

- under on all measures
- under on accuracy +comprehension
- under on accuracy +rate
- under on comprehension
- above on all

Accuracy

Reading profile

0 10 20 30 40 50 60 70

1.57 1.25 1.79 1.21 1.57

pre post
Summary of the effects of intervention and profile on improvement in reading accuracy

In terms of reading profile: all profile groups with n.10 students, (43 cohorts from two to five yos), showed improved reading accuracy with ES >1.00.

In terms of the efficacy of the three interventions: the orthographic intervention delivered the highest gains and the language context the lowest gains for students in their second to fourth years of school while the three interventions had similar outcomes for students in their fifth year.

The difference between the orthographic and oral language interventions is not surprising, given the teaching focus of both.

In terms of the combined effects of type of intervention and reading profile, for students 2nd to 4th yos, the profiles did not differ in their gains.

Given that some profiles had a lower entry accuracy score, this may warrant further examination.
The influence of the number of lessons and weekly frequency on improvement in accuracy.
The influence of the number of lessons on improvement in the phonological intervention
The influence of the number of lessons on improvement in the orthographic intervention

Trend in improvement with number of sessions in orthographic context

- Accuracy
- Number of sessions (decades)

- Pre: 1.21, 1.1, .86, 1.04
- Post: 1.21, 1.1, .86, 1.04
The influence of the number of lessons on improvement in the language intervention

Trend in improvement with number of sessions in language context

Accuracy

number of sessions (decades)

pre

post

Accuracy

number of sessions (decades)
Effect for each reading profile at each year level

Possible only for profiles with \( n > 10 \) students: at risk in all three areas or at risk in accuracy and comprehension (profiles 1 and 2 respectively).

The pattern shows the complexity of teaching reading. The patterns of interactions varied.

For 2\(^{nd}\) yos: learning profiles 1, 2 and 8. Neither total number of teaching sessions nor their weekly frequency influenced reading accuracy for any profile. It was not influenced by the ERIK path chosen.

For 3\(^{rd}\) yos: profiles 1 and 2 neither main effect influenced change in accuracy. For both profiles, rate of change in reading \( \times \) number of lessons was significant.
For profile 2, rate of change in reading was influenced by weekly frequency and intervention pathway.

For those who underachieve in all three areas, different levels of improvement required different total numbers of sessions and different frequencies in different interventions.

For 4\(^{th}\) yos, profile 1 gain was influenced both by the intervention pathway, its interaction with both the total number of lessons and also with the weekly frequency of teaching.
Improvement in Neale comprehension scores

ANOVA: comprehension improved and this was influenced by most of the main effects.

**Number of years of schooling** influenced the improvement. Students in different YOS improved to different extents. The rate was affected by the weekly frequency of lesson.

**The interventions** did not differ in their influence on the improvement. The rate of improvement did not differ across the interventions. Weekly frequency didn’t change a pathway’s effectiveness. It did vary with YOS. Different interventions required different total numbers of lessons to achieve the same level of improvement.

**Total number of lessons** influenced improvement. Children at different YOS needed different total numbers to achieve the same level of improvement in comprehension. The total number by themselves did not increase the rate of improvement.

The **weekly frequency** had much the same effect at all year levels and for all interventions. Varying it changed the level of improvement. Particular combinations of the number of lessons and weekly frequency led to better improvement and to a faster rate of improvement. This held across the different interventions and the year levels.

**Students’ reading profiles** influenced their level of improvement and this changed with YOS. Different reading profiles improved to different extents in different interventions, for different total number of lessons and weekly frequency of lessons.
Improvement in reading comprehension for students in the second year of school

Improvement for each intervention pathway

Improvement in comprehension for each intervention at Year 2

- phon: 0.47
- orth: 1.86
- lang: 1.01
Improvement in reading comprehension for students in the second year of school

Improvement for each reading profile in the phonological pathway

Change in comprehension for each reading profile for the phonological intervention

- Under on all measures: 1.81
- Under on accuracy + comprehension: 1.86
- Under on accuracy: .57
- Above on all: .45

reading profile

pre
post
Improvement in reading comprehension for students in the second year of school

Improvement for each reading profile in the orthographic pathway

Change in comprehension for each reading profile for the orthographic intervention

<table>
<thead>
<tr>
<th>Reading Profile</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under on all measures</td>
<td></td>
<td>3.86</td>
</tr>
<tr>
<td>Under on accuracy</td>
<td>2.37</td>
<td></td>
</tr>
<tr>
<td>+comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under on rate</td>
<td></td>
<td>1.61</td>
</tr>
<tr>
<td>Above on all</td>
<td></td>
<td>3.51</td>
</tr>
</tbody>
</table>

Note: The graph shows the change in comprehension scores for different reading profiles under the orthographic intervention.
Improvement in reading comprehension for students in the second year of school

Improvement for each reading profile in the language intervention

Change in comprehension for each reading profile for the language intervention

- under on accuracy +comprehension: 1.64
- under on comprehension: 3.31
- under on rate: 1.69
- above on all: .74
Improvement in reading comprehension for students in the third year of school

Improvement for each intervention pathway

Improvement in comprehension for each intervention at Year 3

- Phon: 0.90
- Orth: 0.76
- Lang: 0.71
Improvement in reading comprehension for students in the third year of school

Improvement for each reading profile in the phonological pathway

Change in comprehension for each reading profile for the phonological intervention

![Graph showing improvement in reading comprehension for students in the third year of school. The graph illustrates the change in comprehension for each reading profile under the phonological intervention, with metrics such as 'under on all measures', 'under on accuracy +comprehension', and 'under on accuracy +rate'. The graph includes data points and labels indicating improvements like 1.76, 1.69, and 0.80.]
Improvement in reading comprehension for students in the third year of school

Improvement for each reading profile in the orthographic pathway

Change in comprehension for each reading profile for the orthographic intervention

- under on all measures
- under on accuracy +comprehension
- under on accuracy +rate
- under on accuracy

pre
post

.82
.98
.72
.85
Improvement in reading comprehension for students in the third year of school

Improvement for each reading profile in the language pathway

Change in comprehension for each reading profile for the language intervention
Improvement in reading comprehension for students in the fourth year of school

Improvement for each intervention in the fourth year

Improvement in comprehension for each intervention at Year 4

- phon
- orth
- lang

pre
post

.80
.80
.80
Improvement in reading comprehension for students in the fourth year of school

Improvement for each reading profile in the phonological pathway

Change in comprehension for each reading profile for the phonological intervention

- under on all measures: 1.42
- under on accuracy +comprehension profile: 1.86
- under on accuracy +rate: 0.11
- under on accuracy: 0.80
Improvement in reading comprehension for students in the fourth year of school

Improvement for each reading profile in the orthographic pathway

Change in comprehension for each reading profile for the orthographic intervention

- under on all measures: 1.11
- under on accuracy +comprehension: 2.26
- under on accuracy +rate: 1.99
- under on accuracy above: 1.49
- above on all: 1.72
Improvement in reading comprehension for students in the fourth year of school

Improvement for each reading profile in the language pathway

Change in comprehension for each reading profile for the language intervention

Series1
Series2

1.26
1.11
1.75
1.37
2.00
1.20
0.84

under on all measures
under on accuracy +comprehension
under on accuracy +rate
under on comprehension +rate profile
under on comprehension
under on rate
above on all

comprehension
Improvement in reading comprehension for students in the fourth year of school

Improvement in comprehension for each intervention in the fifth year

Comprehension in each context by students in their fifth year

- Phon: 0.65
- Orth: 1.10
- Lang: 1.63
Effect of Reading Recovery on gains?

Of the cohort, 231 students were reported to have had Reading Recovery earlier and 355 students hadn’t.

<table>
<thead>
<tr>
<th></th>
<th>Not RR</th>
<th></th>
<th>RR</th>
<th></th>
<th>T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std.</td>
<td>Mean</td>
<td>Std.</td>
<td></td>
</tr>
<tr>
<td>Neale ACC</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>26.57</td>
<td>13.33</td>
<td>21.84</td>
<td>11.09</td>
<td>4.47**</td>
</tr>
<tr>
<td>Post</td>
<td>38.98</td>
<td>13.073</td>
<td>33.34</td>
<td>12.61</td>
<td>5.05**</td>
</tr>
<tr>
<td>Neale COMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>10.65</td>
<td>9.96</td>
<td>7.96</td>
<td>5.71</td>
<td>3.71**</td>
</tr>
<tr>
<td>Post</td>
<td>18.20</td>
<td>12.13</td>
<td>13.74</td>
<td>7.29</td>
<td>4.89**</td>
</tr>
<tr>
<td>Gain in accuracy</td>
<td>12.33</td>
<td>8.92</td>
<td>11.75</td>
<td>7.99</td>
<td>.78</td>
</tr>
<tr>
<td>Gain in comprehension</td>
<td>7.49</td>
<td>7.67</td>
<td>5.81</td>
<td>4.73</td>
<td>2.90**</td>
</tr>
</tbody>
</table>
This analysis that influence of the total number of lessons and their weekly frequency on improvement in reading comprehension is a complex relationship.

First, it depends on the intervention pathway selected. However, neither the total number of lessons nor the number of lessons per week emerged as significant main effects.

The interaction effects show this complexity. Different intervention pathways require different weekly frequencies of teaching and different total durations.

These outcomes for the cohort as a whole are somewhat surprising. They suggest that making decisions to increase reading comprehension either by simply increasing either the total number of lessons or the number of session each week may not be as effective as also taking account of the intervention pathway selected.

One might expect as well that these decisions need to take account of students’ learning profiles and years of schooling. The following section examines the influence of these variables for learning profiles at the various year levels.
The influence of the number of lessons on improvement in the phonological intervention

Gains for each number of lessons for phonological intervention

Number of sessions

- 2:pre 0.28
- 3:post 0.52
- 4:pre 1.27
- 5:pre 0.90
- 6:post 2.12
- 7:pre 1.34
The influence of the number of lessons on improvement in the orthographic intervention

Gain in comprehension for each total number of lessons for orthographic intervention
The influence of the number of lessons on improvement in the orthographic intervention

Gain in comprehension for the language intervention

Number of sessions

0 5 10 15 20 25 30

2 2.07 1.94 .71 .89 1.37

pre post
• Procedures for identifying particular literacy learning profiles more accurately and an enhanced set of validated placement tasks.

The current literacy learning profile tasks have been normed to grade 2. These could be enhanced with vocabulary tasks, better listening comprehension tasks paraphrasing and summarizing skills and word reading tasks.

• Clarify the connection between the phonological and orthographic pathways. Students with better phonological skills were in the orthographic pathway. After developing ERIK we developed PERI. We need both but do we integrate them into one pathway and have multiple entry points?

• Make more explicit the learning framework that underpins the three pathways and how to move from scaffolding particular strategies to independent use. This was an original purpose of having every fifth session as a review activity.
Implications for the future

• Greater explicit focus on building each student’s identity as a literacy user. Target explicitly students’ intrinsic motivation to engage in reading and what they tell themselves about reading, their self efficacy as readers, their agency as readers, the potential values of reading and the status of reading in their lives and the lives of significant others.

• A revised focus on the format for our intervention. The small group intervention is valuable. A RTI model with gradual transfer back to the classroom with the capacity to gradually embed classroom texts in the ERIK program, more seamless links with regular teaching with the classroom teacher collecting ongoing data monitoring for ERIK students.

• Clearer indicators of when to cease a student’s involvement in a pathway, to discontinue or when to switch to another pathway. I would recommend basing it on their capacity to read over an extended period,
Implications for the future

• Clearer indicators of when to cease a student’s involvement in a pathway, to discontinue or when to switch to another pathway. I would recommend basing it on their capacity to read over an extended period,

I recommend clear indicators based on a student’s ability to read and comprehend independently particular types of texts and words.

This was a purpose of having every fifth session as a review activity. Not only was it intended to review but also to assess a student’s progress. I would recommend including short assessment tasks. A criterion could be the student’s ability to read and comprehend independently appropriate text over a four successive review sessions. These tasks could now be delivered on line in much the same way as On Demand Testing.

• Teaching and texts that are more appropriate for older primary students

• Increased inferential and evaluative comprehension type teaching. This is why we may not be getting a large impact on nap plan darter at this point.

• We need long term retention data and transfer.
The three intervention pathways

**ERIK**

_**Phonological awareness pathway.**_

Each session teaches a spoken onset and/or rime unit through various phonological and phonemic skills (rhyming, blending and segmenting) and using these to read and spell words and to read prose.

_**Orthographic processing pathway.**_

Each session teaches a letter cluster, either a written rime or a written onset for one syllable words.

It teaches word reading skills (segmenting and blending to read written words) and using these in reading and writing activities.

_**Oral language pathway.**_

Each session teaches a comprehending strategy first in oral language contexts and then applied to reading.

The teaching sequence:

- inferring the topic of the text and questions it might answer;
- visualizing sentences and paraphrasing sentences.
Each session comprised the following types of learning activities: students

• recall what they learnt from earlier session by re-reading text from the previous session.

• learn pathway- specific skills (rhyming, sound blending and spoken word segmenting skills in the phonological pathway, segmenting and blending written words using phonic strategies in the orthographic pathway and application of comprehension strategies in the comprehension pathway).

• read and write target words.

• read relevant prose.

• review explicitly what has been learnt.

Every fifth session: review session.

Re-administer prose and isolated word reading tasks, word reading skills for text similar to those used on intervention teaching and build students’ reading self-efficacy.

<table>
<thead>
<tr>
<th>Metacognitive control and agency as a reader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary enhancement</td>
</tr>
<tr>
<td>Paragraph and topic enhancement during reading</td>
</tr>
<tr>
<td>Awareness of pacing one’s self as a reader</td>
</tr>
<tr>
<td>Closer link with writing</td>
</tr>
<tr>
<td>Morphographic knowledge</td>
</tr>
</tbody>
</table>
Very best wishes with your future work