

Speech Rhythm and Reading Development

Potential for Intervention?

Prof. Clare Wood

Overview

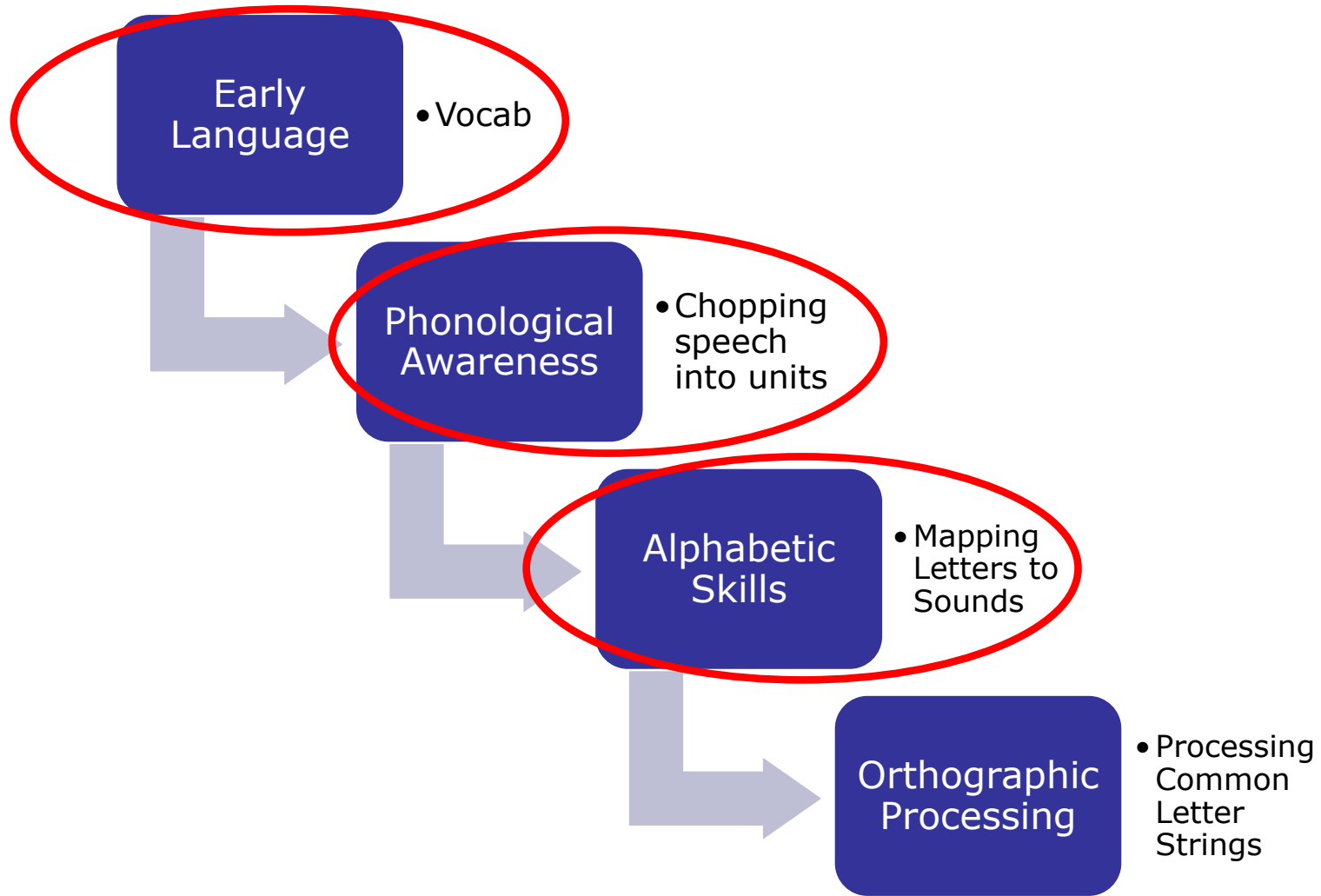
- The Big Question
- The Links between Speech Rhythm and Reading Difficulties
- Speech Rhythm Activities in the Early Years
- Supporting Children with Early Reading Difficulties

The Origins of Reading Difficulties

...and the Big Question



The Origins of Reading Difficulties



Lots of resources for teaching phonics...



Learning to Read...

- Teaching children to read accelerates phonological awareness
 - But it can be developed without formal tuition (Wood & Terrell, 1998; Wood, 2004)
- And there are a group of children in every intervention study who fail to show the 'expected' progress

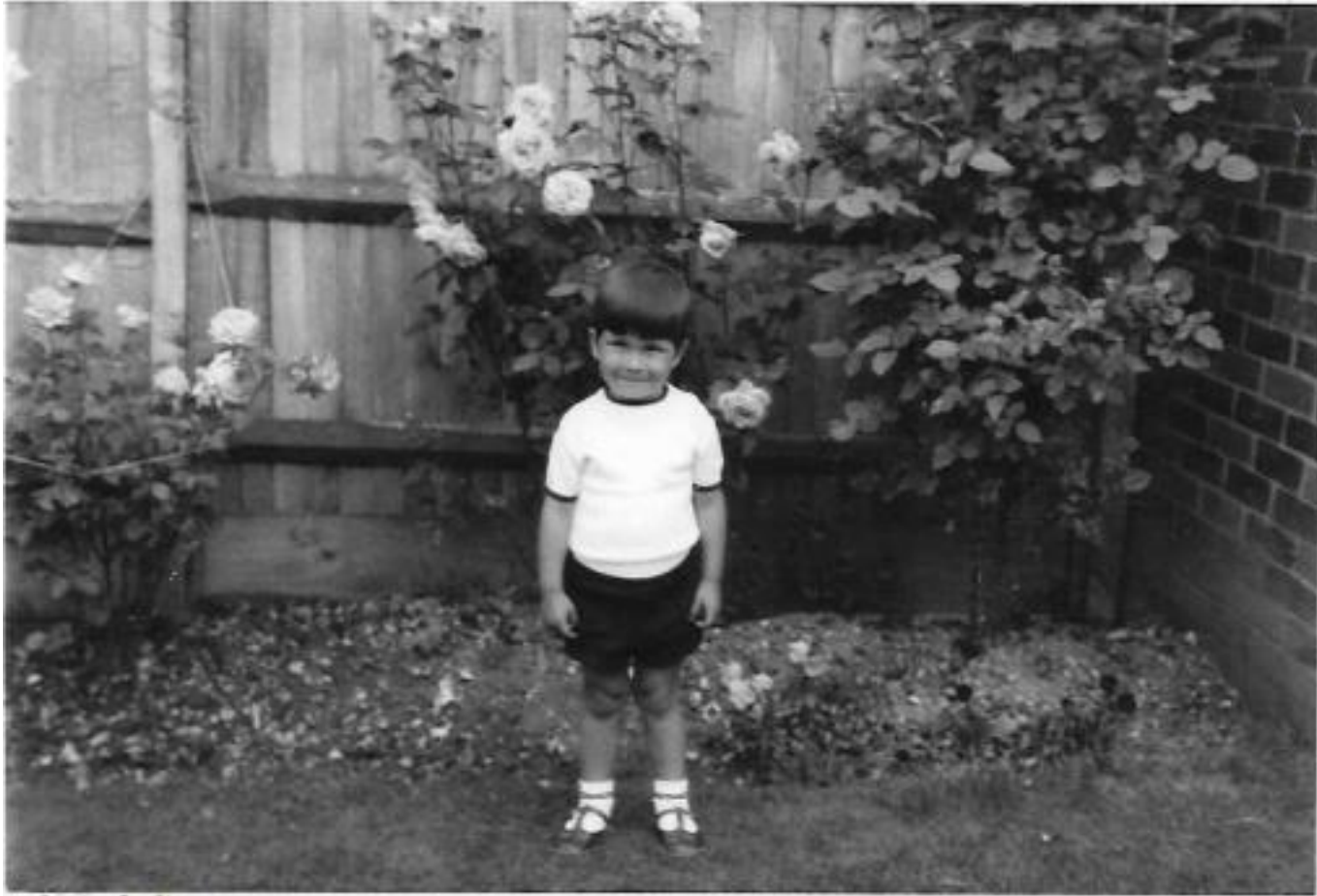
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Individual Differences in Response to Early Interventions in Reading: The Lingering Problem of Treatment Resisters

Joseph K. Torgesen
Florida State University

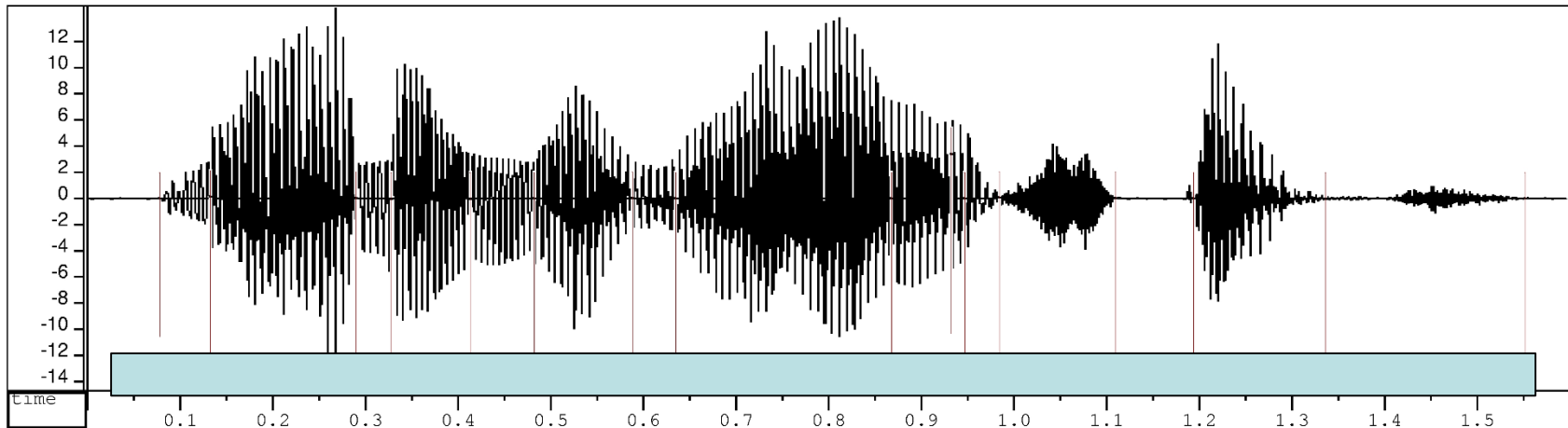
In this article, studies are reviewed that were designed to improve the early reading skills of students with reading disabilities. The challenge of effectively designing interventions in the public schools that adequately meet the needs of all these students is described.

A treatment resister...



The Big Question

- Why do some children struggle to acquire phonological awareness, despite years of being taught the alphabetic principle?



- Child-Directed Speech and the Periodicity Bias
 - Mary had a little lamb
 - Ma-ry had a li-ttle lamb
 - S-W S W S-W S
 - Mary / had a / little / lamb

“In actual reading, the rise and fall of pitch and inflection, the hurrying here and slowing there, what we have called the melody of speech, appears in the inner speech even more prominently than does the articulation of particular sounds, when there is appreciation of what is written.”

– E. B. Huey, 1908/1968

Rhythm Carries Meaning

- **George** had a red truck.
 - George **had** a red truck.
 - George had **a** red truck.
 - George had a **red** truck.
 - George had a red **truck**.
-
- CON-vict vs con-VICT
 - RE-cord vs re-CORD
-
- Sarcasm etc

Can you read the words in red?

The coffee has chosure.

It is chosureful.

The stranger was perlextric.

He was full of perlextricity.

Stress is Linked to Morphology

- Happy HAPP-y
- Happiness HAPP-iness

- Magic MAG-ic
- Magician ma-GI-cian

- Some suffixes make stress `shift`

The Links Between Speech Rhythm and Reading Difficulties

Sensitivity to Speech Rhythm and Reading

British Journal of Developmental Psychology (1998), 16, 397–413 Printed in Great Britain
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Poor readers' ability to detect speech rhythm and perceive rapid speech

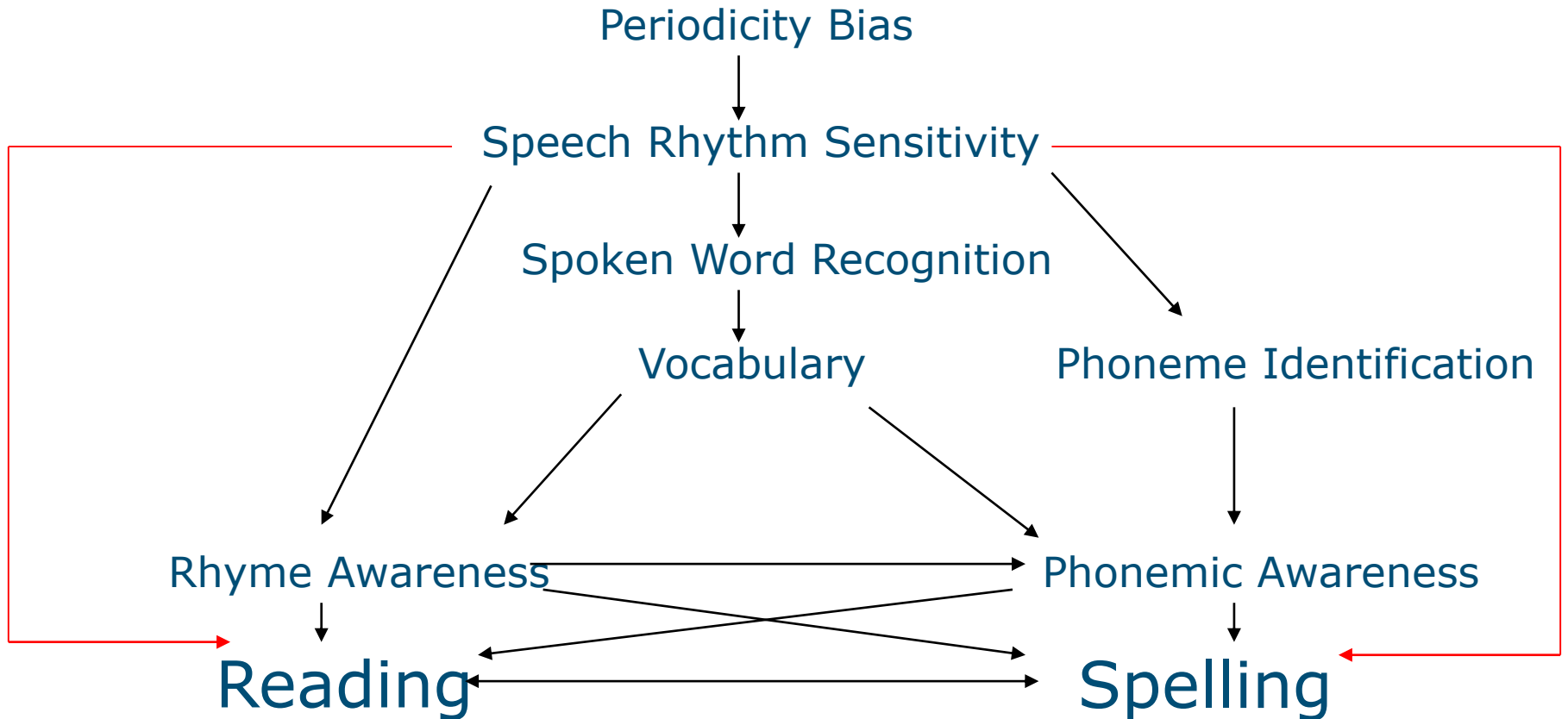
Table 1. Mean details of the experimental and matched control groups (standard deviations in parentheses)

| | Age (in months) | Reading ability (BAS scores) | Spelling ability (BAS scores) | Vocabulary (BPVS scores) |
|----------------------------------|--------------------|---------------------------------|----------------------------------|-----------------------------|
| Experimental group | 108.6 (21.0) | 80.0 (44.0) | 89.8 (48.3) | 86.3 (11.3) |
| Age-matched controls | 108.3 (20.8) | 147.4 (37.0) | 139.1 (34.4) | 101.3 (12.2) |
| Reading age- matched controls | 77.3 (14.2) | 80.1 (44.7) | 89.5 (40.9) | 101.3 (13.8) |

Table 2. Mean scores obtained on the phonological and speech perception measures

| | Mean | SD | Median | Min. | Max. |
|---------------------------------------|--------|--------|--------|------|------|
| Rapid speech perception errors | | | | | |
| Poor readers | 28.167 | 10.888 | 25.500 | 13 | 64 |
| Age-matched controls | 22.833 | 7.168 | 21 | 12 | 40 |
| Reading age controls | 25.167 | 4.639 | 26 | 14 | 32 |
| Rhythmic matching | | | | | |
| Poor readers | 5.133 | 1.408 | 5.000 | 2 | 7 |
| Age-matched controls | 6.5 | 1.306 | 6.5 | 4 | 9 |
| Reading age controls | 5.433 | 1.478 | 5.500 | 3 | 8 |
| Rhyme detection task | | | | | |
| Poor readers | 5.600 | 2.486 | 5.500 | 1 | 10 |
| Age-matched controls | 8.300 | 1.860 | 9.000 | 3 | 10 |
| Reading age controls | 8.033 | 1.608 | 8.000 | 5 | 10 |
| Phoneme deletion | | | | | |
| Poor readers | 12.000 | 5.527 | 13.000 | 0 | 22 |
| Age-matched controls | 19.567 | 3.617 | 20.500 | 10 | 24 |
| Reading age controls | 13.333 | 6.706 | 15.000 | 0 | 24 |
| Syllable detection | | | | | |
| Poor readers | 6.000 | 1.894 | 6.500 | 0 | 8 |
| Age-matched controls | 7.033 | 1.273 | 7.500 | 4 | 8 |
| Reading age controls | 6.600 | 1.993 | 7.000 | 0 | 8 |
| Letter sound knowledge | | | | | |
| Poor readers | 10.267 | 2.982 | 11.000 | 0 | 13 |
| Age-matched controls | 11.667 | 1.539 | 12.000 | 9 | 14 |
| Reading age control | 11.067 | 2.815 | 12.000 | 0 | 14 |

A tentative model



Speech Rhythm is Just Rhythm, Right?

Educational Psychology
2010, 1–21, iFirst Article



The contribution of sensitivity to speech rhythm and non-speech rhythm to early reading development

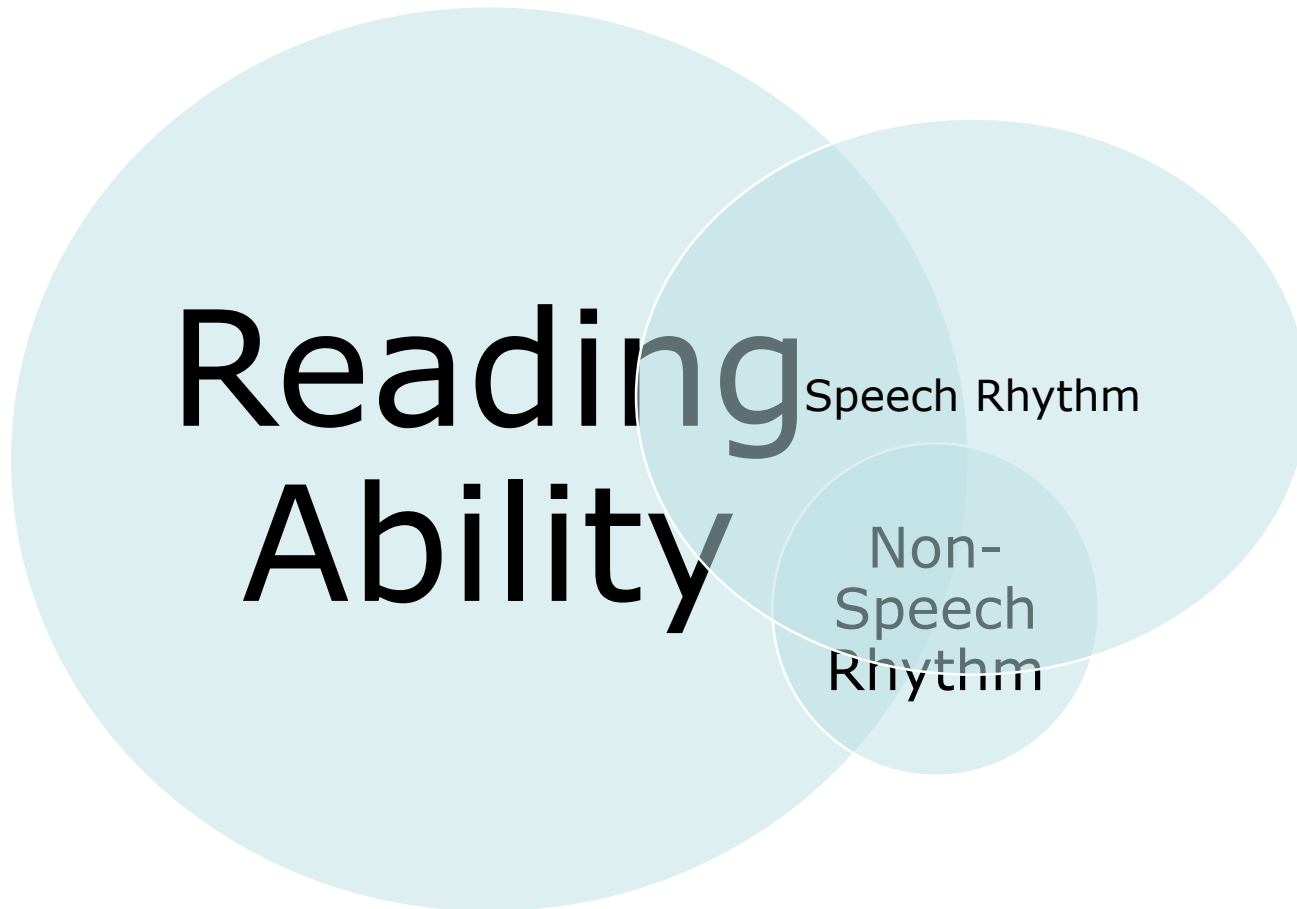
Andrew J. Holliman^{a*}, Clare Wood^a and Kieron Sheehy^b

^a*Department of Psychology, Faculty of Health and Life Sciences, Coventry University, Coventry, UK;* ^b*Department of Education, Open University, Milton Keynes, UK*

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- They are related (weakly) to each other
 - Speech rhythm sensitivity can account for unique variance in reading scores after sensitivity to non-speech rhythm has been controlled for.
 - Non-speech rhythm cannot explain reading performance after speech rhythm sensitivity has been taken into account.
-

To put it another way...



Summary of key findings

- Holliman, Wood & Sheehy (2010b)
 - Speech rhythm sensitivity can predict reading development a year later
- Holliman, Williams, et al. (2014)
 - Stress, intonation and timing are separable elements of speech rhythm
- Holliman, Mundy et al. (2014)
 - Speech rhythm contributes to reading indirectly in 5-7 year-olds, via vocabulary / morphology and rhyme – segmental phonology less important
- Holliman et al. (2017)
 - Speech rhythm is an important predictor of multisyllabic word reading in children aged 7-8 after controlling for PA, MA, vocab and memory
- In short, speech rhythm appears to be an important but relatively neglected area of reading development theory

So What?



- Speech rhythm is implicated in the development of reading-related skills
- Individuals with reading difficulties are also characterised by difficulties in speech rhythm sensitivity.
- Can speech rhythm awareness be trained?
- If it can, does it transfer to reading skills?



The Intervention Studies

Speech Rhythm Activities in the Early Years

- Harrison et al (2018) – Journal of Research in Reading
- Reception children assessed on
 - Single Word Reading; Phonological Awareness; Vocabulary
 - Speech Rhythm Sensitivity
- Three treatment groups:
 - New Speech Rhythm-Based Intervention
 - A Traditional Phonological Intervention
 - A Control (maths-based) Intervention
- 10 Week Intervention Period

Compound Nouns Task: 1

- Which set of pictures goes best with what you have heard?

- Set 1:



- Set 2:



Compound Nouns Task: 2

- Which set of pictures goes best with what you have heard?

- Set 1:



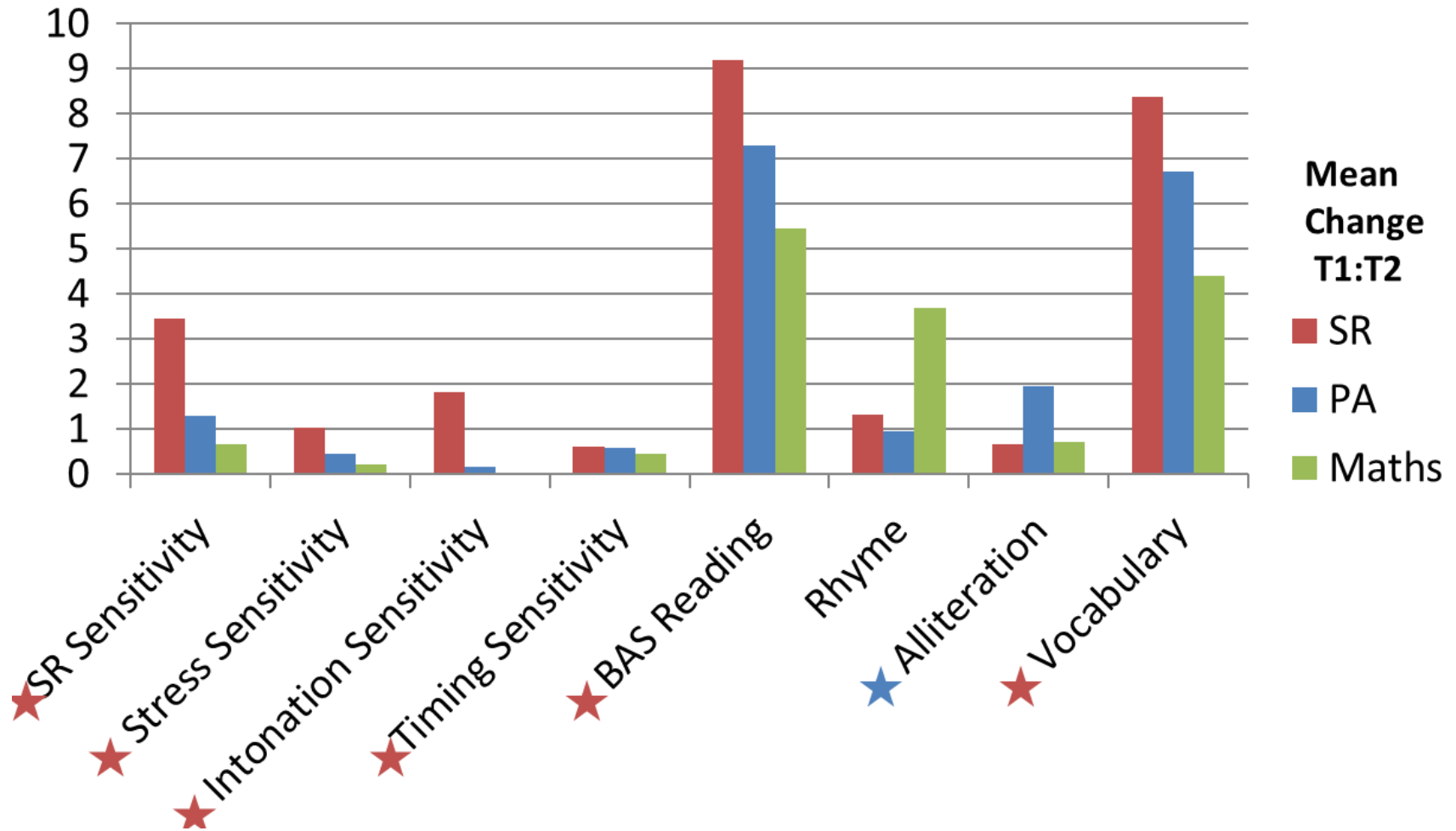
- Set 2:



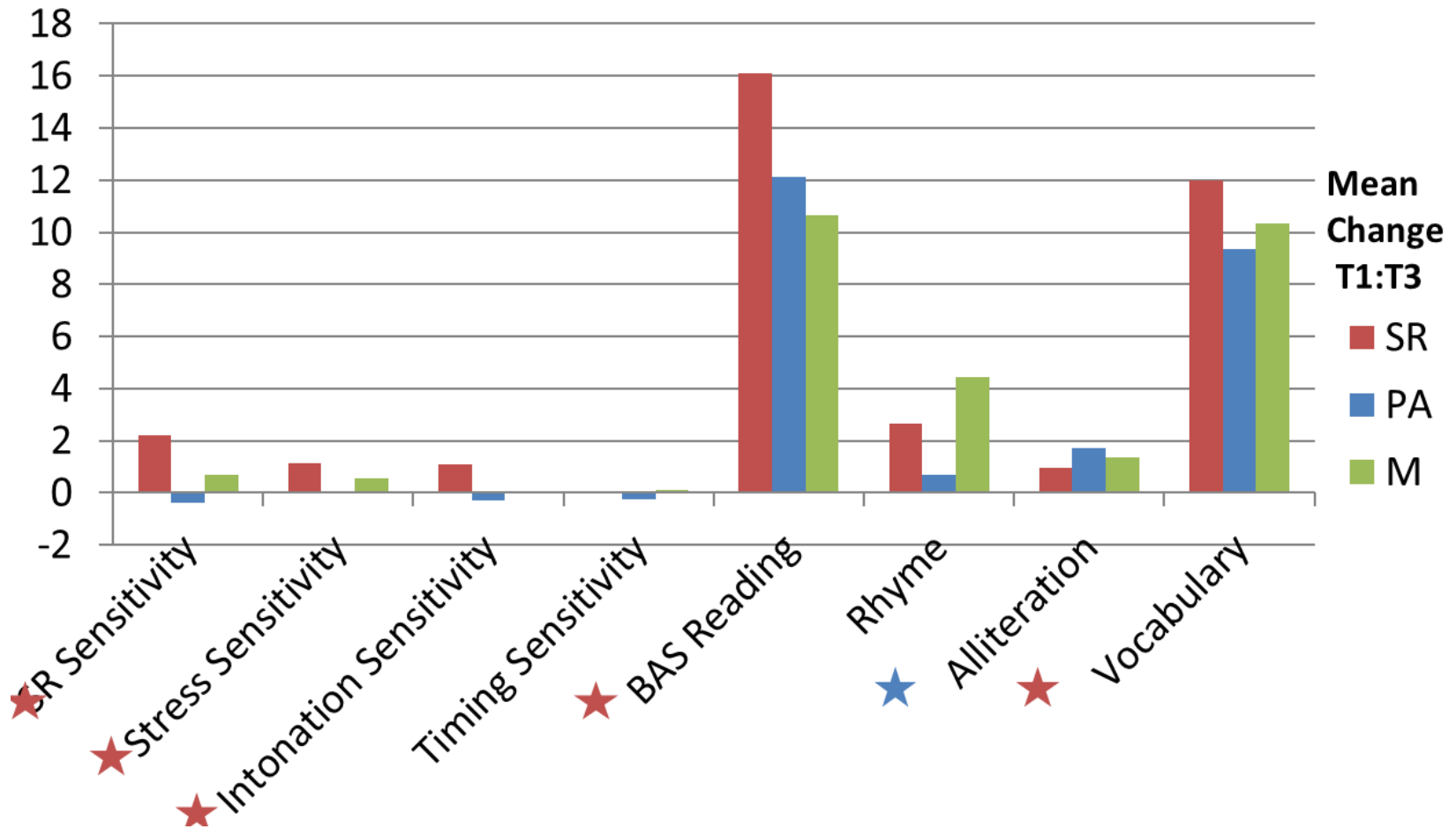
Other Activities

- Mispronunciations Task
- Intonation Detection (Question or Statement)
- Taking a sentence from a book or poem and seeing if the child can correctly select a word that is a good rhythmic 'fit' for that sentence
 - "*Slinky Malinki was blacker than black,*
a stalking and lurking...
 - (a) adventurous cat, (b) scary cat, or (c) misbehaving cat"

Immediate Post Test Performance



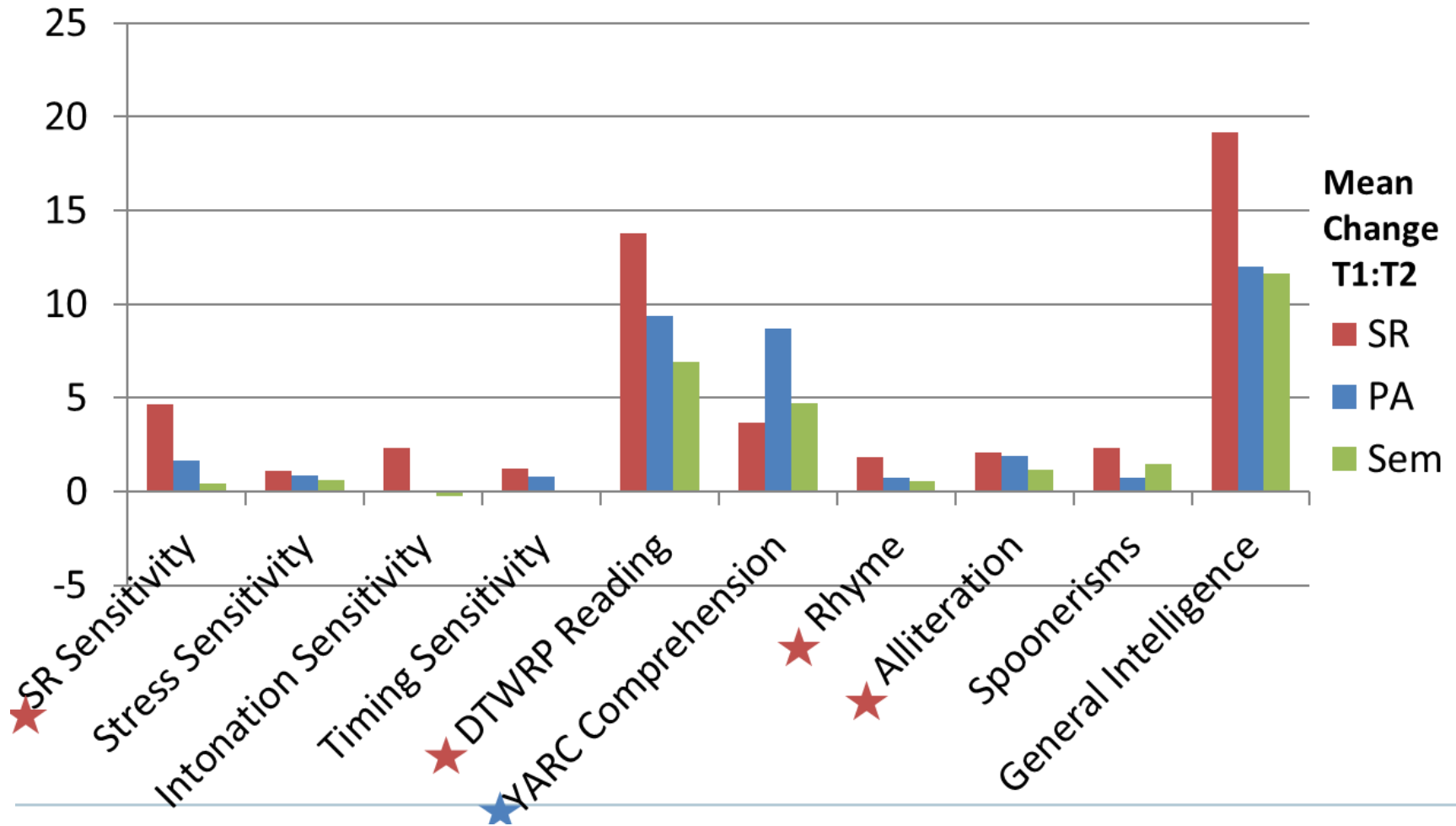
Delayed Post Test Performance



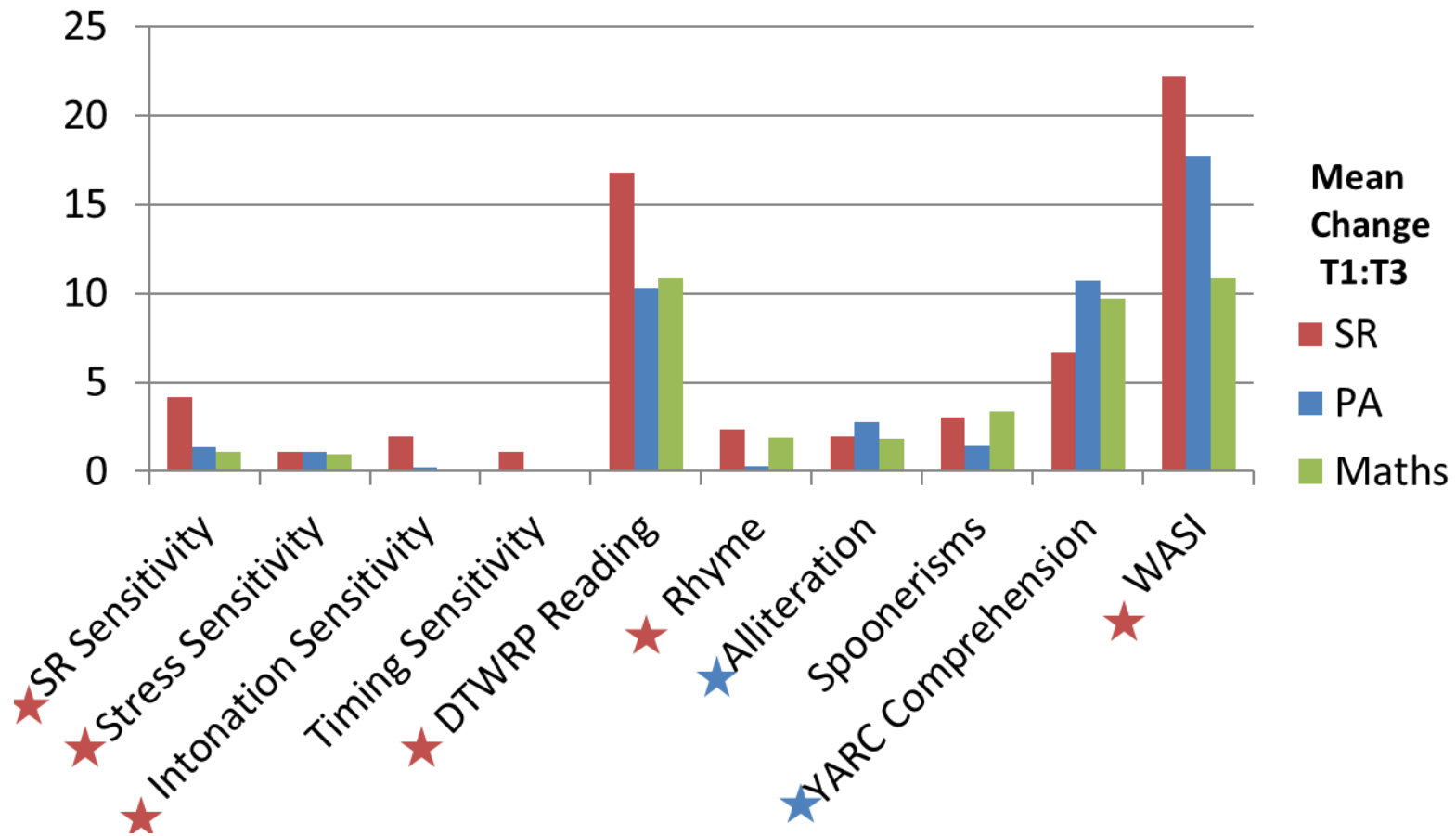
Supporting Children with Reading Difficulties

- Year 3 children - 6 months or more below expected level
 - Single Word Reading
 - Reading Comprehension
 - Phonological Awareness
 - General Intelligence
 - Speech Rhythm Sensitivity
- Control group received semantics training

Immediate Post Test



Delayed Post Test



What happened next...



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Teach Primary Reading Planet Review



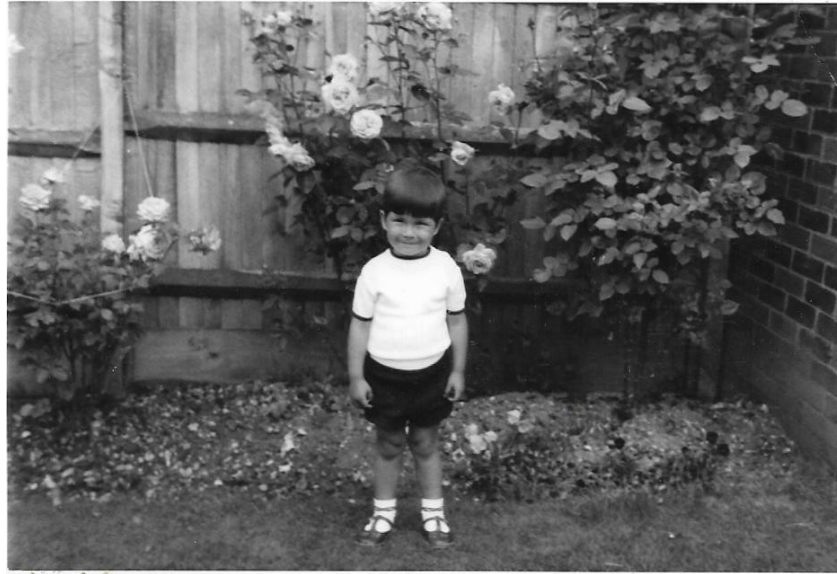
"Reading Planet really redefines our understanding of how children learn to read. It challenges our approach and encourages us to think how we teach phonics. This isn't about ditching or replacing our phonics teaching, but adding to and evolving it. You won't have come across anything like this before, but because it is supported by research you know that it's no quick-fix or publishing folly. It's a highly credible approach that will change the way you teach, and it's a sound investment in more ways than one, with activities galore to explore."

[Click here to read the full review.](#)

John Dabell, Teach Primary

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“This isn’t about ditching or replacing our phonics teaching, but adding to and evolving it...It’s a highly credible approach that will change the way you teach.”



Thank you!

- British Academy
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- Social Sciences and Humanities Research Council of Canada
- Rising Stars
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