

Using a mispronunciation correction intervention to examine the relationship between vocabulary and decoding

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Outline

- I. Introduction and previous research
- II. Method
- III. Results
- IV. Conclusions and implications

I. Introduction and previous research

- The simple view of reading (Gough and Tunmer, 1986)

decoding x linguistic comprehension = reading comprehension

Key question: *what contribution does vocabulary make to decoding?*

I. Introduction and previous research

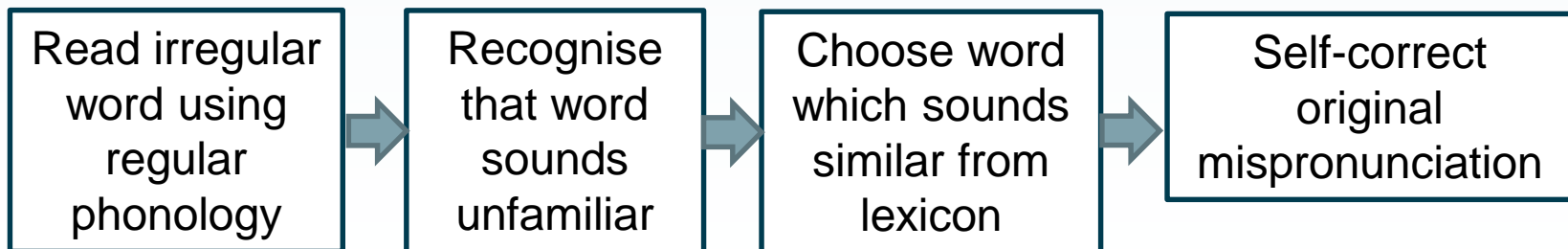
Evidence for links between vocabulary and decoding irregular words:

- Taylor, Plunkett and Nation (2011)
- Wang, Nickels, Nation and Castles (2013)
- Ricketts, Nation and Bishop (2013)

I. Introduction and previous research

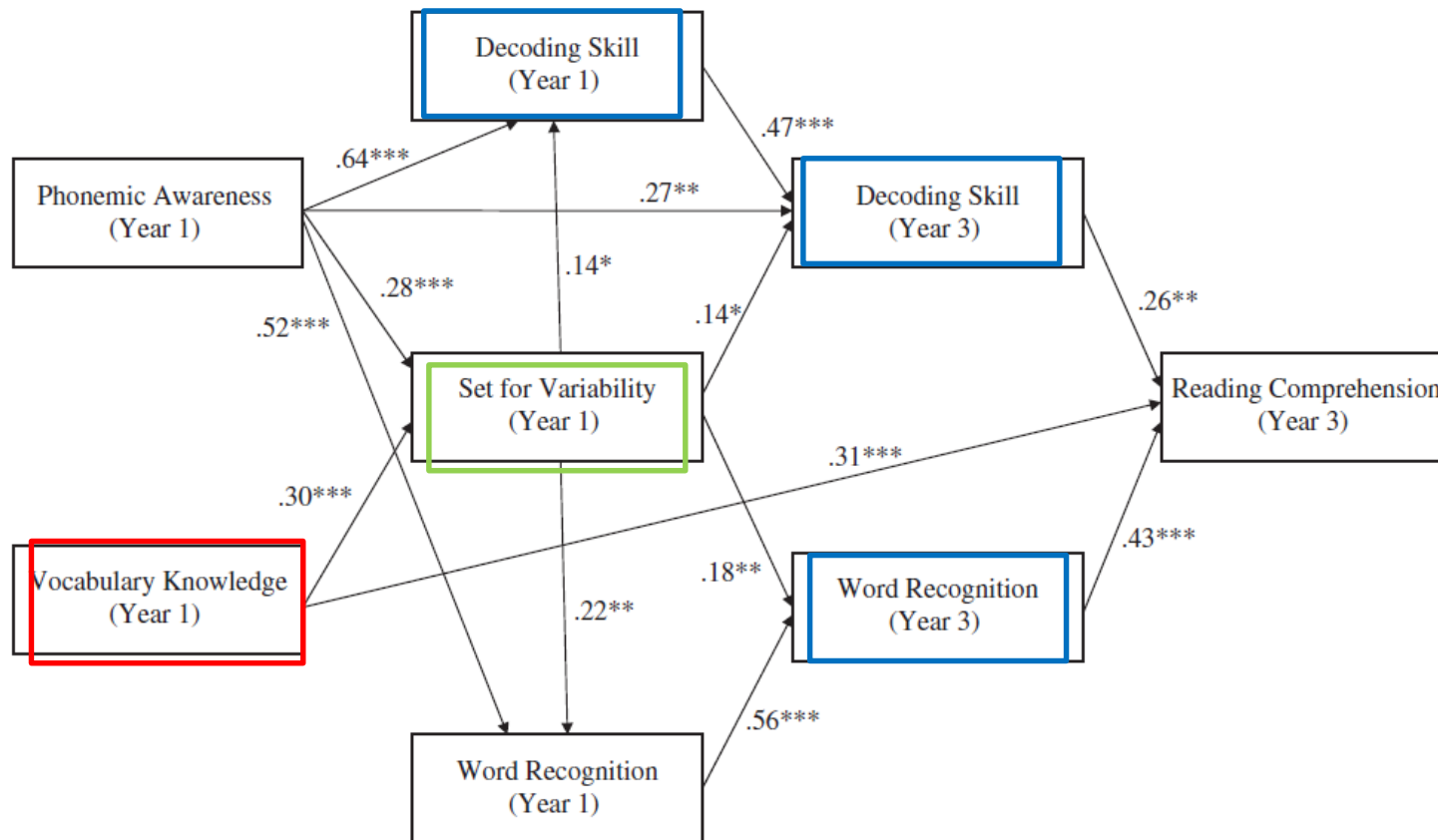
Why is there a relationship between vocabulary and decoding, particularly of irregular words?

- Tunmer and Chapman (2011)
- Elbro, de Jong, Houter and Nielsen (2011)
 - A second step in word decoding:
 - Set for Variability (Tunmer and Chapman, 2011)
 - Spelling pronunciation to lexical access (Elbro et al., 2011)
 - Mispronunciation correction



I. Introduction and previous research

- Tunmer and Chapman's (2011) model:



I. Introduction and previous research

Key questions:

1. What effect does a mispronunciation correction intervention have on reading (decoding)?
2. Does mispronunciation correction mediate the relationship between vocabulary and reading of irregular words?

II. Method

Participants: 84 year 1 and 2 children from a mainstream primary school (aged 5-7)

Assessment (T1): All children assessed on measures of vocabulary, reading and mispronunciation correction

Randomisation: Children randomly assigned to intervention (n=42) or control (n=42)

Intervention: Small group teaching (6-8 children per group) conducted by research assistants. Each group received 20 minutes of training twice per week for four weeks.

Follow-up (T2): All children re-assessed on measures of vocabulary, reading and mispronunciation correction

II. Method

Assessments:

- **BPVS** (shortened) – receptive vocabulary
- **Castles and Coltheart** – regular, irregular and non-word reading
- **YARC** – Letter Sound Knowledge, Early Word Recognition, Sound Deletion

★ **Mispronunciation Correction** ★

II. Method

Mispronunciation correction:

- 40 irregular items
- For each item, children had to do the following:
 - a) correct the mispronunciation

Example: “My puppet is going to say some sentences but he’s going to say the word at the end wrong. Can you tell him what the word should be?”

Her granny is very *kind* (rhyme with skinned)

The dog had to have a *wash* (rhyme with cash)

- b) read the word aloud
- c) give a definition

Items taken from Tunmer and Chapman’s word list for their 2011 trial.

II. Method

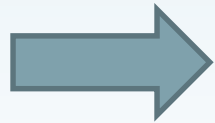
Intervention Programme

- Focused on:
 - Helping children to understand the difference between “easy words” (regular pronunciation) and “tricky words” (irregular pronunciation)
 - Teaching children to choose words from their mental lexicon that might match a word they have read which is unfamiliar
 - Training children on 20 specific irregular targets from Tunmer and Chapman’s word list (20 words untaught and used as control words).

III. Results

Key questions:

1) Is there a significant effect of group on reading of the 20 target words and 20 control words?



Data analysed using an ANCOVA to examine the effect of group on reading at T2, controlling for reading at T1.

2) Does mispronunciation correction mediate the relationship between vocabulary and decoding at an item level?

III. Results

- 1) Is there a significant effect of group on reading of the 20 target words and 20 untaught words?

	Intervention Group Mean (SD)		Control Group Mean (SD)	
	T1	T2	T1	T2
Target words	7.27 (5.56)	14.95 (6.14)	7.11 (5.62)	9.59 (6.06)
Untaught Words	7.86 (5.61)	11.46 (5.22)	7.59 (5.93)	9.92 (5.68)

Target Words

$F(2, 71) = 87.88, p < 0.001, Adj R\text{-squared} = 0.70$

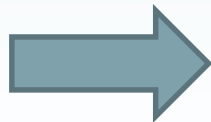
Untaught Words

$F(2, 71) = 109.49, p = 0.043, Adj R\text{-squared} = 0.75$

III. Results

Key questions:

- 1) Is there a significant effect of group on reading of 20 target words and 20 control words?
- 2) Does mispronunciation correction mediate the relationship between vocabulary and decoding at an item level?



Data analysed using a mixed effects logistic regression model with participants and items treated as crossed random effects.



NOTE: the items used in the following analysis include both taught items and control items.

III. Results

2) Does mispronunciation correction mediate the relationship between vocabulary and decoding?

Three steps to building the final model...based on a series of questions:

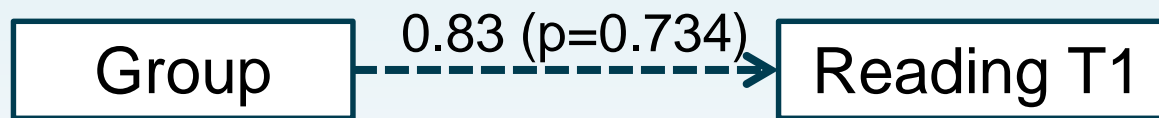
1) Are the intervention and control groups significantly different on reading ability at T1?

 Are mispronunciation correction and definition ability independent predictors of reading at T2? 

3) Do mispronunciation correction and definition ability fully account for the differences between the groups' reading abilities at T2?

III. Results

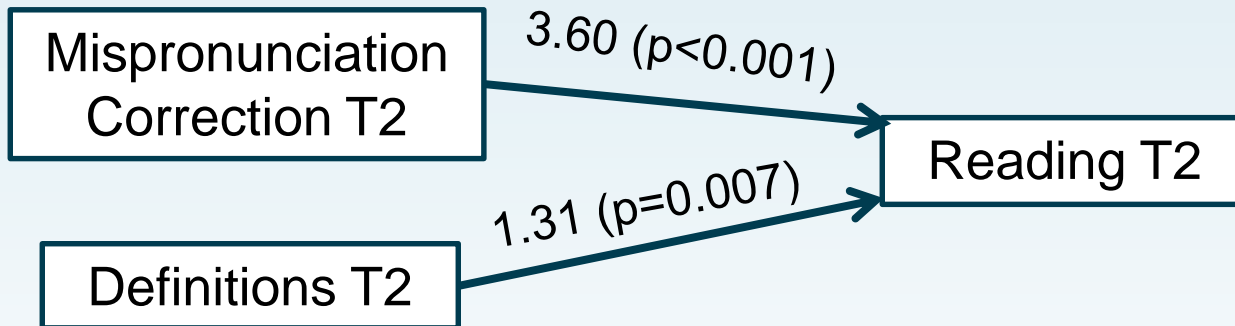
1) Are the intervention and control groups significantly different on reading ability at T1?



No significant difference, therefore autoregressor can be excluded from the model.

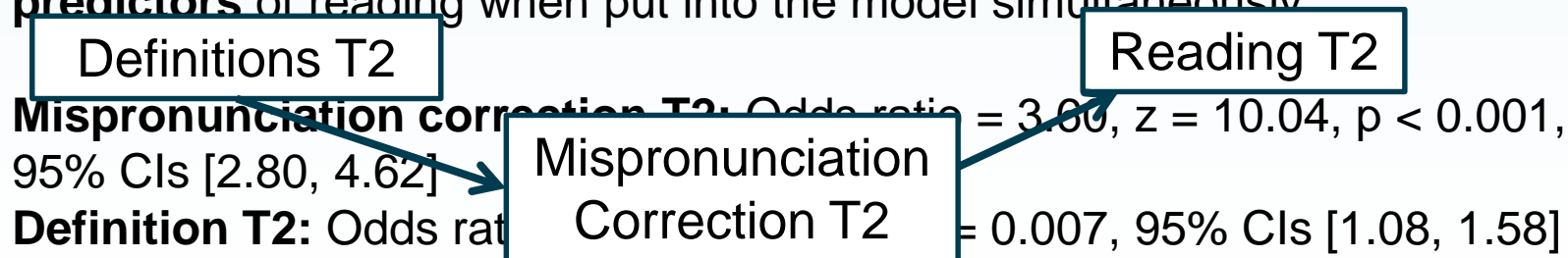
III. Results

2) Are mispronunciation correction and definition ability independent predictors of reading at T2?



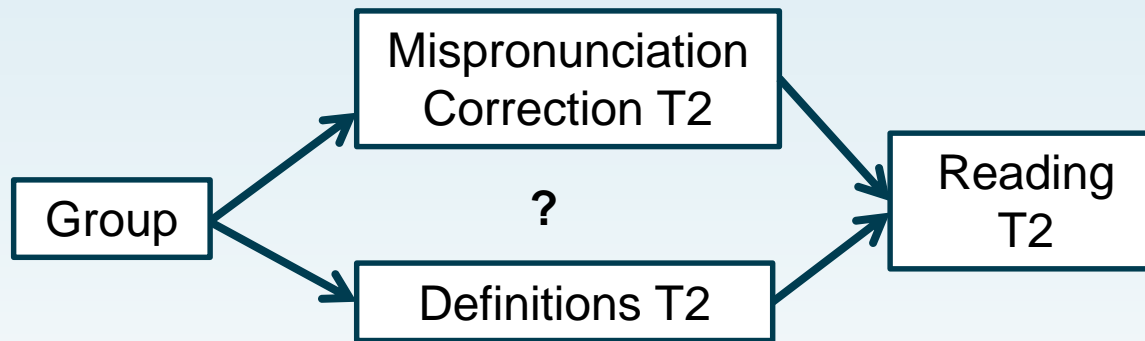
OR

Both mispronunciation correction and definition ability are **significant predictors** of reading when put into the model simultaneously:



III. Results

3) Do mispronunciation correction and definition ability fully account for the differences between the groups' reading abilities at T2?



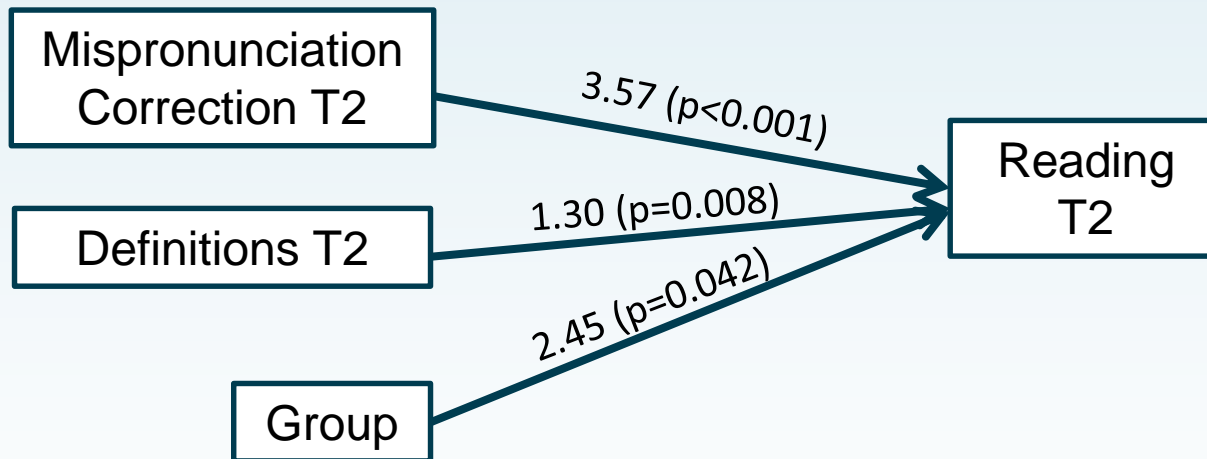
Or did the intervention affect other things which contributed to change in reading ability at T2?

Group is still significant when added to the model along with mispronunciation correction and definition ability (odds ratio = 2.45, $z = 2.03$, $p = 0.042$, 95% CIs [1.03, 5.82])

III. Results

The final model

Numbers reported are odds ratio (significance values in brackets)



This model shows that Mispronunciation Correction (T2), Definitions (T2) and Group are all significant independent predictors of Reading (T2).

IV. Conclusions and Implications

1) What effect does training mispronunciation correction have on decoding of irregular words?

Training mispronunciation correction improved the reading of taught and untaught irregular words.

2) Does mispronunciation correction mediate the relationship between vocabulary and reading of irregular words?

Our study did not replicate the mediation model (Tunmer & Chapman, 2011). Instead, vocabulary and mispronunciation correction were independent predictors of reading.

Possible hypothesis:

- Definitions > semantic effect
- Mispronunciation correction > phonological effect

Acknowledgements

Supervisor:	Professor Charles Hulme
Secondary Supervisor:	Professor Wendy Best
Project Funders:	Dr. Jonathan Solity University College London
Research Assistants:	Charlotte Wilkinson Aoife Stone-Ghariani

With thanks also to all the staff, children and student volunteers who helped make this project possible.