

The evidence for systematic phonics is weak:  
We need to start exploring alternative methods

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# What is Systematic Phonics?

- The key claim is that initial reading instruction should teach Grapheme-Phoneme Correspondences (GPCs) in a systematic manner before focusing on the meaning of written words.
- Systematic phonics **rejects** alternative methods including:
  - Whole Language/Balanced Literacy that focus on the meanings of written words embedded in stories. Not teaching GPCs systematically enough.
  - Early Morphological Instruction that explains how words are built of meaningful parts (morphemes). Too complicated.

There is widespread consensus for systematic phonics in the research community for two main reasons:

1. Empirical research: Many dozens of studies and meta-analyses (that summarize multiple studies) appear to show that systematic phonics is more effective than common alternative methods.
2. Theory: English is claimed to follow the “alphabetic principle” according to which letters represent sounds. On this view, phonics is simply teaching children the logic of their writing system.

But this is all wrong. Briefly I'll show:

1. The empirical evidence does not support systematic phonics over common alternatives such as whole language and balanced literacy.
    - Methods are equally effective (or ineffective).
  2. The English writing system does not respect the “alphabetic principle”.
    - Letters are designed to represent both phonology **and** meaning (through morphology).
- **Conclusion:** We should consider alternatives to systematic phonics
    - Briefly outline an approach called “Structured Word Inquiry” (SWI) that teaches children the logic of the English writing system with the aim of improving reading, spelling, and vocabulary.

# Organization of talk:

1. Briefly review the empirical evidence taken to support systematic phonics.
2. Briefly review the theoretical case for systematic phonics.
3. Briefly review an alternative method called Structured Word Inquiry (SWI).

The empirical case for systematic phonics is flawed in two fundamental ways:

1. The results from many meta-analyses are often mischaracterized, with the strong conclusions drawn from weak results.
2. Most importantly: The design of meta-analyses do not even test for the claim that systematic phonics is better than common alternative methods, including whole language and balanced literacy.

# Quick review of the mischaracterizations of meta-analyses:

National Reading Panel (2000) or NRP (2000) analyzed the results of 38 experiments that compared systematic phonics to alternative methods.

	Immediate	Delay
Overall	<b>d= 0.41</b>	<b>0.27</b>
Naming regular words	0.67	
Pseudoword naming	0.6	
Spelling words	0.35	
Reading text	0.25	
Comprehension	0.27	

Headline figure.

(In statistical terms this is a significant but a small effect)

- Main conclusion: "Systematic phonics instruction helped children learn to read better than all forms of control group instruction, **including whole language**". [bold added]

# But:

	Immediate	Delay
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Many of the most important measures somewhat smaller (still significant)



# But:

	Immediate	Delay
Overall	<b>0.41</b>	<b>0.27</b>
Naming regular words	0.67	
Pseudoword naming	0.6	
Spelling words	0.35	<b>~.23</b>
Reading text	0.25	<b>~.16</b>
Comprehension	0.27	<b>~.18</b>

} The overall effect reduced by ~35% over the course of a 4-12 month delay on testing.

} Might expect these important measures to be reduced follow a delay as well.  
\*\*These long-term effects not assessed

But:

-Struggling readers above grade 1 whose intelligence was below average (or not assessed) did not benefit:  $d = .15$  (not significant).

	Immediate	Delay
Overall	.15	<del>0.1</del> 0.27
Naming regular words		0.67
Pseudoword naming		0.6
Spelling words		0.35 ~.23
Reading text		0.25 ~.16
Comprehension		0.27 ~.18

# What should you conclude?

- If you take NRP (2000) meta-analysis at face value (which you should **not** as I'll explain shortly) then should conclude something like:

*Systematic phonics provides a small short-term benefit on word reading, spelling, and comprehension, but these effects are substantially reduced following a delay of 4-12 months, with no demonstration of long-term benefits on spelling, reading text, or comprehension, and no benefit for struggling readers with below average intelligence.*

- What about more recent meta-analyses?
  - All subsequent meta-analyses show weaker effects although they are routinely cited as providing evidence for systematic phonics.

## Torgerson et al. (2006)

- Analysed the subset of studies included in the NRP (2000) that were randomized control trials (studies with the best design)

	Original	Updated estimate*
Word reading accuracy	0.27-.38	0.20-.21; <b>NS</b>
Comprehension	<b>NS</b>	
Spelling	<b>NS</b>	

\*After the authors **themselves** excluded flawed study by Umbach et al. (1989) with an absurd effect size of 2.69 for word reading accuracy.

# McArthur et al. (2012)

- Assessed the efficacy of systematic phonics with children, adolescents, and adults with reading difficulties.

	Original	Updated estimate*
Word reading accuracy	0.47	<b>0.16; NS</b>
Nonword reading accuracy	0.76	
Word reading fluency	<b>NS</b>	
Reading Comprehension	<b>NS</b>	
Selling	<b>NS</b>	
Nonword reading fluency	<b>NS</b>	

\*After removing two outlier studies by Levy et al. the benefit on word read accuracy was no longer significant.

-In Levy et al. (1999), children given one-on-one phonics instruction for 20 days to teach 48 words. Control group received arithmetic practice (no reading instruction of any kind).

-Similar approach in Levy et al. 1997.

# Galuschka et al. (2014)

- Meta-analysis of randomized controlled studies that focused on children and adolescents with reading difficulties

	Effect size	# studies	Significant?
Phonics	0.32	29	Y
Phonemeic awareness training	0.28	3	N
Reading fluency trainng	0.3	5	N
Auditory training	0.39	3	N
Colour overlays	0.32	4	N
Reading comprehension	0.18	3	N

She similar effect sizes were observed with most methods, but only phonics significant because many more studies were carried out with phonics.

## Suggate (2016)

- Assessed the short- and long-term impacts of phonemic awareness, phonics, fluency, and comprehension interventions on pre-reading, reading, reading comprehension, and spelling measures.

Instruction Type	Immediate	Delayed (~1 year)
Overall	0.37	0.22
Phonics	0.29	<b>0.07</b>
Fluency	0.47	0.28
Comprehension	0.38	0.46
Phonemic awareness	0.43	0.38

} Phonics had the worst long-term outcomes of all methods

Nevertheless, some researchers cite this work as providing evidence for systematic phonics....

Bad enough that the weak results from these meta-analyses are used to support phonics, but there is a more fundamental problem:

- These meta-analyses did not even test the hypothesis that systematic phonics is better than whole language or balanced literacy.

What????

- Need to understand the difference between systematic and non-systematic phonics.



Whole language and balanced literacy include **non-systematic** phonics as opposed to **systematic** phonics. That is, GPCs taught when needed, but it is not the focus of instruction and GPCs not taught in a specific order.

- For example, in the UK, Her Majesty's Inspectorate (1990) observed in 470 classes and over 2,000 children: They wrote:
  - “..phonic skills were taught almost universally and usually to beneficial effect” (p. 2) and that “Successful teachers of reading and the majority of schools used a mix of methods each reinforcing the other as the children's reading developed (p. 15).

\*\*\*So relevant question is whether systematic phonics (now legally required in England) is better than previous forms of instruction that included unsystematic phonics.

Here is the problem:

- The NRP (2000) meta-analysis compared systematic phonics to a control condition that **combined** two types of interventions:
  - 1) studies that included unsystematic phonics, such as whole language and balanced literacy.
  - 2) studies that included no phonics, such as whole word instruction.
- NRP (2000) found that Systematic Phonics > average of (1) & (2) but did not test the hypothesis that Systematic Phonics > (1).

\*\*\*\*This means that the NRP (2000) meta-analysis did not even assess whether systematic phonics is better than whole language and other forms of instruction that were common in the USA and the UK.

- When Camilli et al. (2006) reanalysed the NRP (2000) studies but compared systematic phonics to non-systematic phonics, an overall **non-significant** effect of .12 was obtained.
  - The effects would be even smaller for the most meaningful measures such as spelling, reading text, and comprehension, and smaller still at a delay.

	Immediate	Delay
Overall	.12 <del>0.41</del>	<del>0.27</del>
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- That is, the NRP (2000) does not provide any evidence that systematic phonics is more effective than whole language or balanced literacy.

## It gets worse:

- Every subsequent meta-analysis that claims to provide evidence that systematic phonics made the same mistake.
  - Bowers, J.S. (2018). Reconsidering the evidence that systematic phonics is more effective than alternative methods of reading instruction. *PsyArXiv*. <https://psyarxiv.com/xz4yn/>
- So even the very weak effects from the meta-analyses I just described should not be taken as providing weak evidence for systematic phonics. The meta-analysis did not even test whether systematic phonics was better than whole language and balanced literacy.

**Bottom line:** There is no empirical evidence for systematic phonics.

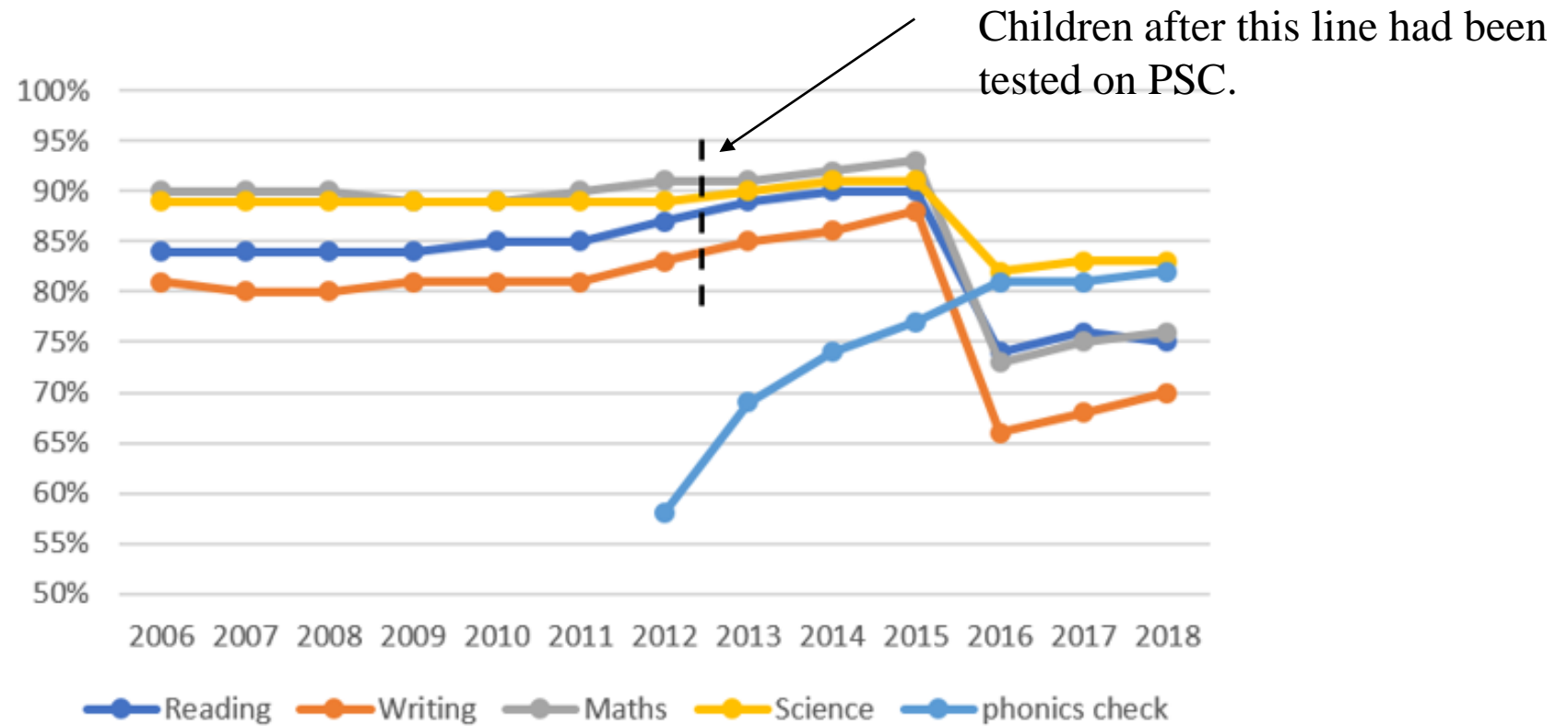
# What about the dramatic increase in scores on the Phonics Screening Check (PSC)?

- The PSC tests how well children can name aloud regular words and nonwords.

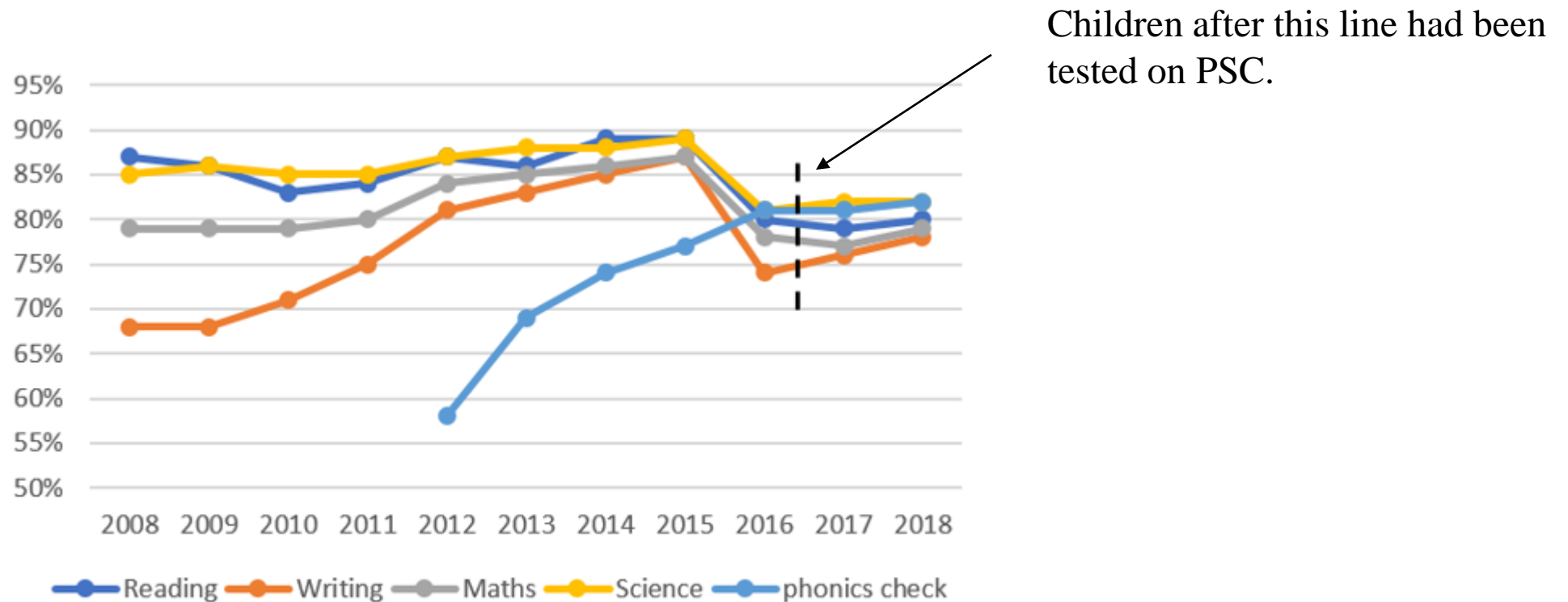


- But this has not translated into better performance in reading more generally. The only thing that has improved is performance on the PSC.

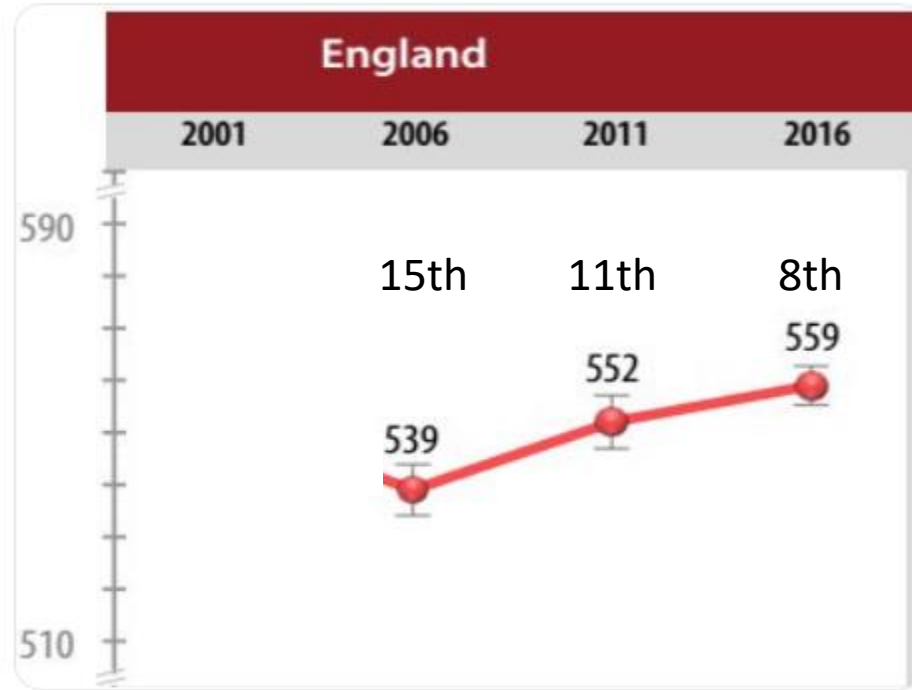
Key Stage 1 SAT scores in reading & writing did not improve more than maths or science even though the PSC scores increased dramatically.



Key Stage 2 SAT scores in reading & writing did not improve more than maths or science even though the PSC scores increased dramatically.



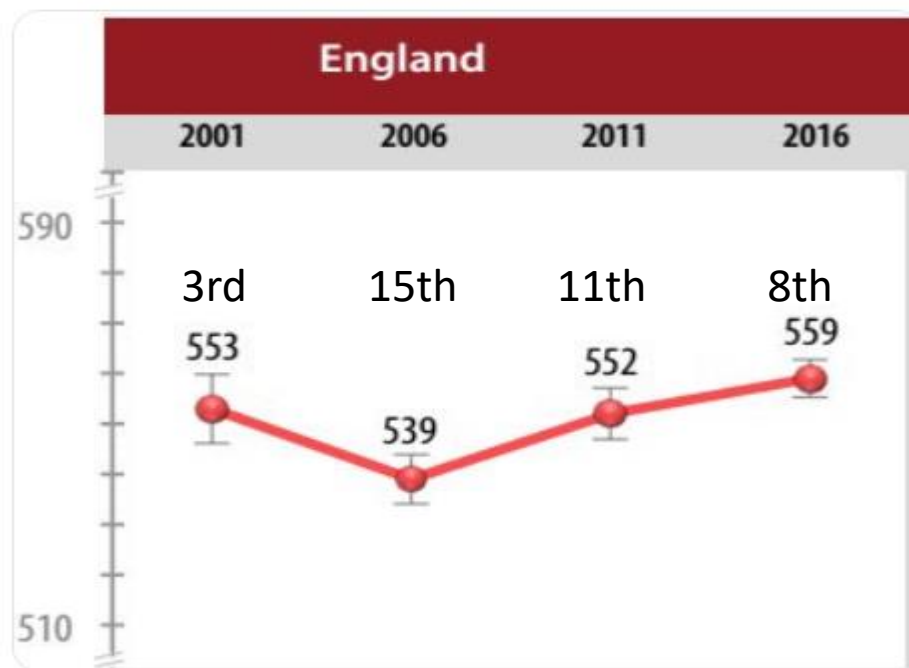
What about the excellent PIRLS (Progress in International Reading Literacy Study) results in England? Test assessed reading comprehension across multiple countries



-Sir Jim Rose, author of the Rose (2006) report, claimed that “the spectacular success of England shown in the latest PIRLS data” provides further evidence in support of systematic synthetic phonics (Rose, 2017).



**But:** England did well in 2001 before systematic phonics was required in schools (this fact is generally ignored).



**Furthermore:** The 2016 scores mixed in private school results. When exclude private schools England drops to 11th (that is, no gain from 2011-2016 while PSC scores jumped up).

**Furthermore:** Northern Ireland (that has not mandated systematic phonics or use the PSC) did better than England in 2011 & 2016.

# Conclusion:

- Teaching children to pass the PSC improves performance on the PSC but has had no discernible effect on reading performance more generally.

# But what about the “alphabetic principle”?

- Commonly claimed that English follows the alphabetic principle. According to the alphabetic principle letters and combinations of letters (graphemes) are the symbols used to represent the speech sounds of a language (phonemes).
- If letters represent sounds, then it makes theoretical sense to first teach children Grapheme-Phoneme Correspondences (GPCs): Phonics is simply teaching children the logic of their writing system.

# Obvious problem with the alphabetic principle:

- English has many “exception” words that cannot be read aloud correctly using phonics.
  - Well over 20% of words in children’s books are irregular according to phonics. See: Bowers, J.S., and Bowers, P.N. (2018). *Current Directions in Psychological Science*.
  - In adult text, only ~50% of spellings can be predicted on the basis of their sound: See: Crystal, D. (2003).
- Should we conclude that the English spelling system works according to the alphabetic principle, it is just seriously flawed version of alphabetic principle?

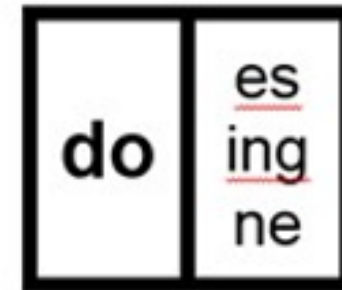
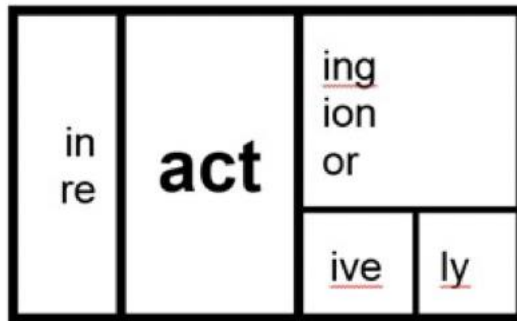
# Another hypothesis: English spelling system is morphophonemic

- On this hypothesis, letters are used to encode phonology (through graphemes) **AND** meaning (through morphology).

## Which hypothesis is correct?

- Consider the “homophone principle”: The observation that most homophones are spelt differently (e.g., too/two/to; sea/see, sale/sail, etc.).
  - On the hypothesis that letters represent sound, then most homophones should be spelt the same. The opposite is the case.
  - Instead, the different spellings mark distinctions in meaning.

- Or consider the “morphological principle”: The observation that the spelling system prioritizes the consistent spelling of morphemes over the consistent spellings of phonemes.



It is <action> not \*<acshion> highlighting that the spelling system prioritizes meaning.

It is <does> not \*<duz> highlighting that the spelling system prioritizes meaning

There are not cherry picked examples. This is consistently the case.

\*\*\*The alphabetic principle, the homophone principle, and the morphological principle can't all be right.

Conclusion: Neither data nor theory support systematic phonics.

Raises a question:

- Why not teach all regularities that exist in the English writing system (phonological and semantic) rather than just a subset (phonological)?

Structured Word Inquiry (SWI) provides a promising alternative systematic phonics:

- SWI teaches children the logic of the English writing system in order to improve, vocabulary, spelling, and reading.

- One critical tool of SWI is the morphological matrix that highlights how words are related to one another in terms of spelling and meaning.

un	<b>heal</b>	s		
		ing	ed	er
		th	y	er
				est
				ly
				ness

un	<b>please</b>	es	
		ed	
		ing	ly
dis		ant	ly
			ness
		ure	s
			able
			ably

un	<b>ease</b>	y	er
			est
dis			ly
			ness
		es	
		ing	
		ed	



- Another critical tool is the word sum that highlights how individual words are built. This can be used to teach spelling.

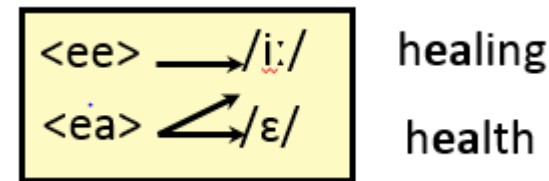
un	<b>heal</b>	s ing ed er		
		th	y	er est ly ness

heal + th → health

heal + ing → healing

un + heal + th + y → unhealthy

- GPCs are taught explicitly within the context of morphology. In this way, can explain **why** graphemes map onto multiple phonemes.



**heal** + ing → **heal**ing (<ea> digraph maps onto 'long e')  
**heal** + th → **heal**th (<ea> digraph maps onto 'short e')

Affixes also have flexible GPCs:

dog + s → dogs     <s> → /z/  
 cat + s → cats     <s> → /s/

GPCs do not cross a morpheme boundary:

re + act → react     no <ea> digraph  
 hot + house → hothouse     no <th> digraph

# If time:

- Here is a short 5-min video of pre-school children in US learning the morphological family of the base <rain> using SWI.
- Notice how the morphological matrix is used to teach vocabulary, comprehension, spelling, and the naming of words. Together.

<https://vimeo.com/189070725>

- Here is a link to a very short survey (10 questions) that asks teachers what they know about morphology. Please no one here fill it out. (you know too much now!) But if some of you can distribute this to teachers at your school I would very much appreciate it. It has ethics approval from U of Bristol: <https://exppsy.onlinesurveys.ac.uk/literacysurvey>

# Conclusions:

1. Little or no empirical evidence to support the claim that systematic phonics is better than whole language or balanced literacy.
  - The so-called “reading wars” are a draw.
2. The theoretical motivation for systematic phonics is flawed. Spellings represent sounds AND meaning.
3. Given failure of systematic phonics (and whole language and balanced literacy), testing alternative proposals should be a priority.
4. One promising alternative: Children should be taught the logic of the English writing system from the start.

# Thanks for listening!

References you can download from my personal webpage:

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