

Where Does The “Science of Reading” Go From Here?

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My work:

To improve literacy outcomes by utilizing basic research in
cognitive science & neuroscience

Via changes in teacher education
 classroom practices
 instructional materials

Focus on learners from minority, lower income backgrounds for whom needs are greatest.

(Washington & Seidenberg, American Educator, 2021)

But, low achievement isn't limited to them.

It's an obvious idea:

1. Much is known, about

skilled reading
relations between reading and speech
learning to read
brain bases of reading
causes of reading impairments
in different writing systems, languages

2. Need to improve outcomes

many indicators
NAEP, PISA, state assessments
“gaps”

1 + 2 = 3 The Science of Reading

The “science of reading” doesn’t mean the same thing to researchers and educators.

Researchers:



Educators:

An approach to reading instruction, teacher education

“Science of reading” laws in 30+ states, which mandate
curricula consistent with SoR
instruction consistent with SoR
in-service teacher PD

New curricula, guides (Kilpatrick, Hegerty, LETRS)
New professional organizations (TRL) and enterprises

Side note:

The “Science of Reading” volume is a review of cognitive, developmental, and neurobiological research on reading published in 2023. The research that is taken as foundational in the “science of reading” approach in education is either not mentioned at all (e.g., the Reading Rope), or mentioned in passing as a precursor to modern work (e.g., the Simple View).

The “science of reading” movement is an important development.

It has been successful already:

It largely dislodged the whole language/balanced literacy approach, which was deeply entrenched.

This has opened the door to change.

Where it still a work in progress: incorporating research-based principles and practices

“Science of reading” approach is based on a small number of concepts
taken from a few simple, dated studies
which are being used to justify a variety of classroom practices,
including ones that are contradicted by *other research*.

(Seidenberg, Cooper Borkenhagen & Kearns, RRQ, 2021)

(Seidenberg & Cooper Borkenhagen, Reading League Journal, 2020)

Not enough science in the “science of reading”.

What this talk is about:

This is an important moment in attempts to reform reading education.

Important to

examine what is being taught under the “science of reading” rubric.

Important to

resist the creation of a new dogma.

Important to

not squander a singular opportunity.

Cheerleading aside, the approach has to work.

In my view, the fate of the “science of reading” experiment is very much up in the air.

Something to understand, and to do something about.

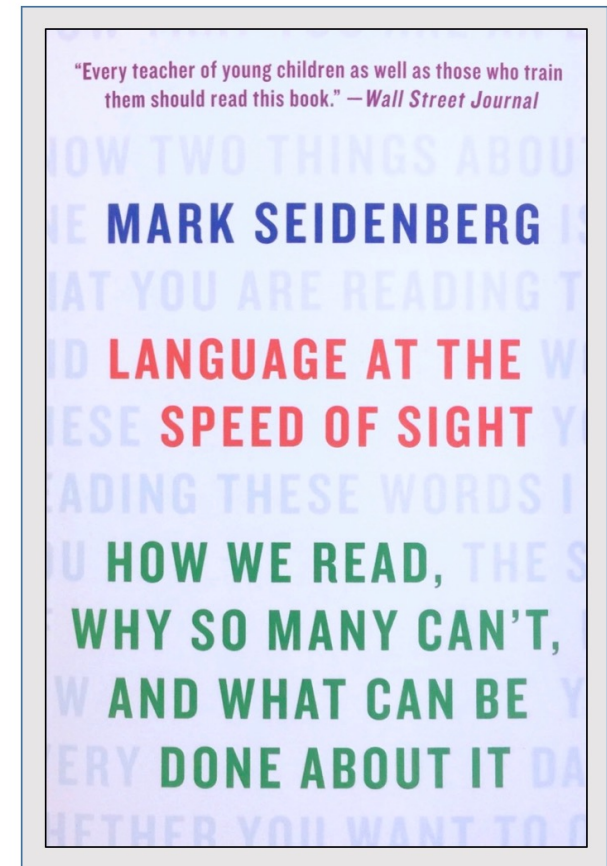
Some recent history

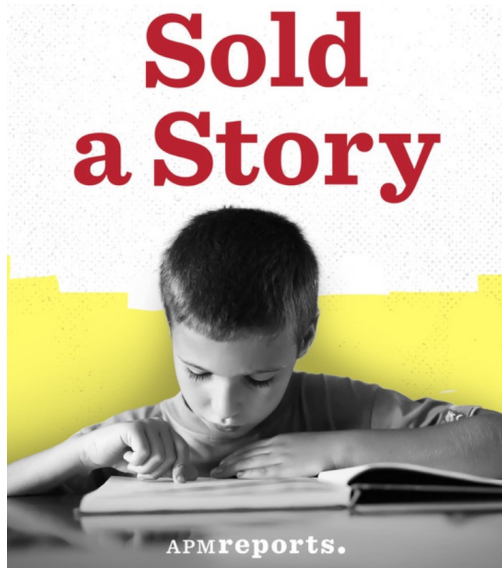
In 2017 I published a book.

- 9 chapters about how reading works

- 3 about the disconnection between science and education

- Need for change





Emily Hanford's podcasts brought concerns about how reading is taught to a **much** larger audience. Irony.

Much other media coverage since.



Photographs by Trent Bozeman for The New York Times

OPINION
NICHOLAS KRISTOF

Mississippi Is Offering Lessons for America on Education

12/4/23

OPINION
JOHN MCWHORTER

We Know How to Teach Kids to Read

Shelve the fad methods. There's one tried-and-true way, and it works for children of all races and classes.

Sept. 3, 2021



What Costs \$1,000 Per Student and Might Help Children Learn to Read?

A new study found that California schools got positive results from a targeted investment in the science of reading — even with the challenges of pandemic recovery.

Seidenberg. YALE

A third important development:
creation of advocacy groups such as Decoding Dyslexia.

Parents were angry, and they organized.

Focused on legislative remedies at state level

Screening for children at risk, provision of appropriate instruction

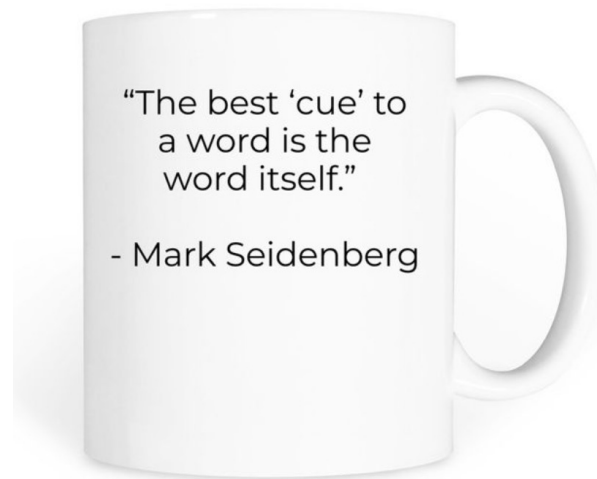
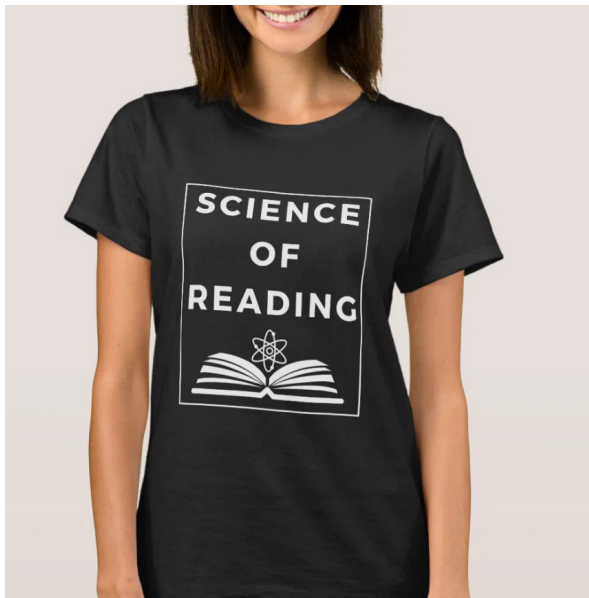


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And many others

A “science of reading” movement emerged.



MERCH!

Great News! Science Wins!

Pretty amazing, given antipathy to science elsewhere

Here, thousands of teachers and other educators want to know *more* about research.

This is progress. But there's a hitch.

Identifying what was wrong was much easier than
figuring out what to do instead.

Especially given lack of relevant background, expertise at all levels of educational
establishment:

- teachers, principals, superintendents
- school boards
- curriculum authors
- state depts of education
- politicians and their staffs
- journalists, literacy advocates

Plus: very few scientists on the front lines.

In my view, "science of reading" laws were a **necessary evil**.

Other approaches to change had failed.

But, mandating something doesn't make it happen.

Recall NCLB mandate: all 4th grade children to read at grade level by 2014.

The laws stipulate that instruction should be consistent with the "science of reading".

What science are we talking about? Who decides?

We need to look.

Whole Language/Balanced Literacy: Major assumptions

1. about phonology: for poor readers (Frank Smith)
2. about context in word reading: sophisticated guessing (Ken Goodman; 3-cueing method)
3. about learning: like first language acquisition. (Goodman again)
4. About the role of instruction: guided discovery. (Calkins et al.)

Problem?

1. Reading depends on spoken language; phonological information is crucial to skilled reading; Linking print and sound. Alphabetic principle. Spelling-sound mappings (phonics).
2. Contextual guessing is inefficient, error-prone. The most reliable cue to a word is the word itself.
3. Not like learning a first language.
4. Requires explicit instruction.

Why did people accept so much that was wrong?

Teachers and others relied on “experts” who were not reliable informants. They didn’t have the background to independently assess their claims.

Such as:

Richard Allington: dyslexia is only as an excuse for poor teaching.

Goodman: good readers only sample words in texts

Science of reading approach: Major assumptions

- a. Learning to read is not like L1 learning. It's an "unnatural act" (Gough, 1989).
Explicit instruction required.

- b. Emphasis on print: Simple View of Reading (Gough & Tunmer, 1986).
Child "already knows" language, needs to learn how print represents it.

- c. Phonemic awareness is foundational, enabling skill (NRP, 2000)
Learn 44 phonemes. "in the dark". Phoneme deletion, substitution tasks.
Kilpatrick, Hegerty, LETRS.

- d. Build reading skill by components:
Phonemes, graphemes, grapheme-phoneme correspondences (phonics), morphology, vocabulary, fluency, etc..

- e. you can't have too much of a good thing.
Some learners don't need all this instruction, but it's not harmful.
At worst, additional practice with essential skills.

Science of reading: Major assumptions valid?

a. Learning to read is not like L1 learning. It's an "unnatural act" (Gough).
Explicit instruction required.

but: implicit learning

most of knowledge that supports reading isn't learned via explicit instruction

ex: vocabulary. Few of the thousands of words we know are ever taught.

same for spellings, phonics, morphology, etc.

b. Emphasis on print: Simple View of Reading (Gough & Tunmer)

but, language has the biggest impact. (Scarborough)

most reading problems *aren't about print*.

c. Phonemic awareness is foundational, enabling skill (NRP)

Learn 44 phonemes. "in the dark". Phoneme deletion, substitution tasks.

misinterpretation of research literature

PA is the outcome of skilled reading, not precursor

phonemes are abstractions not units of speech

don't have "correct" pronunciations



(Science of reading advocate demonstrates "correct" pronunciations of phonemes.)



Fetishizing Phonemes

Science of reading: Major assumptions valid?

d. Building reading skill by components:

Phonemes, graphemes, grapheme-phoneme correspondences (phonics), morphology, vocab, fluency, etc..

But, Ignores basic fact that codes are correlated. Each type of info bootstraps others.

Focus on components instead of reading

Failure to distinguish what teacher needs to know vs. reader

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e. You can't have too much of a good thing

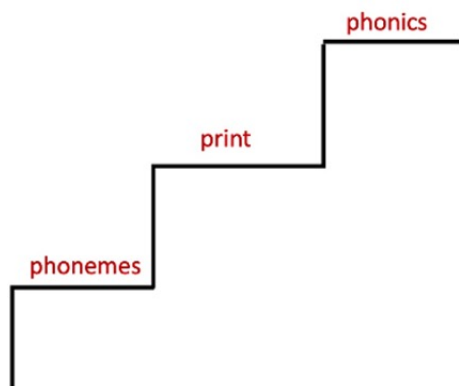
Of course you can.

The clock is ticking.

The goal is to get in, get out, move on

SoR “structured literacy” is a plodding approach. Low expectations about rate of progress.
(Phonemic awareness practice in 3rd grade.)

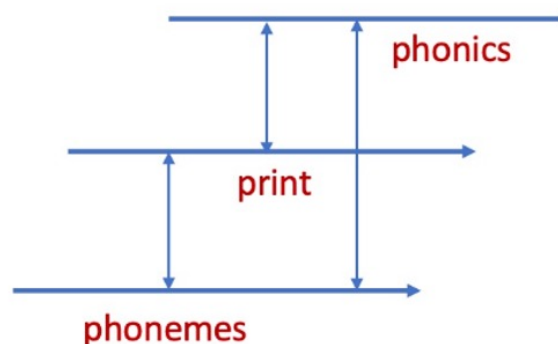
“Teach the components” approach



“Science of reading” approach.
Child must reach performance threshold to move on to next component.

This approach has no basis in research.

Interactive account



These types of information are correlated.
Teaching one can involve teaching others.
How to make instruction efficient.

This approach is based on basic facts about about these types of knowledge and about how children learn.

Why ~~did~~ do people believe this stuff?

Teachers and others rely on experts who are not scientists and are not reliable informants about research.

But, audience doesn't have the expertise to evaluate the claims.

(Same reasons as before.)

Where does the science of reading go next?

As before, easier to see what's wrong than to figure out what to do instead.
A few suggestions:

Tenets for Teachers

1. Goal of reading instruction is reading

Eyes on the prize!

Components only justified to the extent they advance this goal.

No fixed requirements to learn a certain amount of them.

2. Language development is key

Everything in reading depends on knowledge of spoken language

Knowledge of school English varies enormously

Huge effects on progress.

Starting reading instruction earlier, in pre-K, does not address this!

3. Goal is to facilitate *cracking* the code, not teaching the code

Goal of instruction is for child to learn what there is to learn – how the code works – and to gain enough basic facts to enable reading simple texts with decreasing reliance on external feedback.

4. Explicit instruction is there to scaffold statistical/implicit learning. Only as much as needed *and not one bit more.*

SoR assumes that everything has to be taught or else it won't be learned (because "unnatural").

That's wrong (because of implicit learning) and it's inefficient (SLOW).

5. What teachers need to know about reading, language differs from what children need to know in order to read.

Focus on teaching children to read, not teaching them *about* components of reading and language.

6. Instruction must be equitable: effective for all children

Lots of phonics doesn't work for speakers of other dialects, English language learners

7. Take a developmental approach. What is relevant to teach changes over time.

e.g., Initially, knowledge of language derives from spoken language experience.

With literacy, knowledge of language derives from reading experience.

8. Exploit correlations between types of information, rather than teach independent components

Treating learning to read as learning a series of subskills (phonemes, orth, phonics, etc)

is popular because it corresponds to a natural scope and sequence: teach one after another.

But, this step-by-step scope and sequence isn't accurate about

reading and language: the components aren't independent.

how children learn: learning is attuned to how parts are related—correlations, overlap, similarities

illustration of correlations between different types of knowledge: language and topic knowledge

Learning to read involves learning about **print language world**

Basic skills instruction is predicated on the fact that print and language are related.

What about language and knowledge of the world?

Learning about a topic entails learning new language. They're not independent!

Amusing demonstration: Randall Munroe, *Thing Explainer*. <https://xkcd.com/1133/>

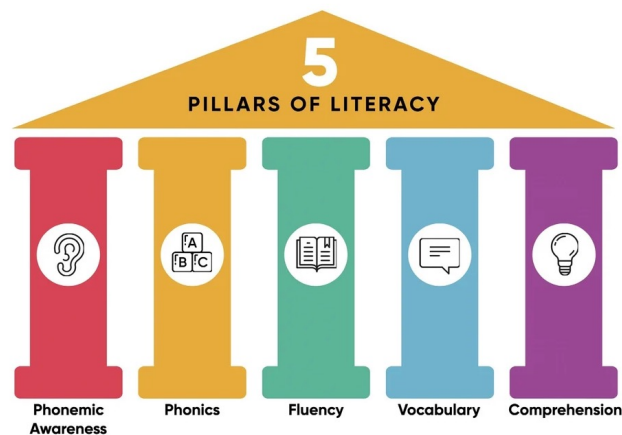
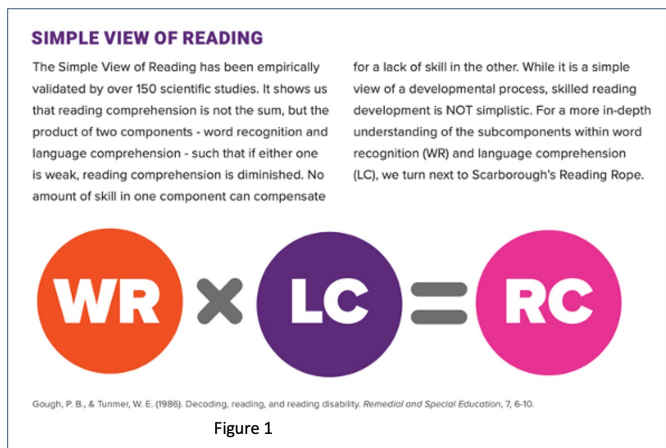
Can you explain concepts using only the 1000 most frequent words?

Yes, but not very well:

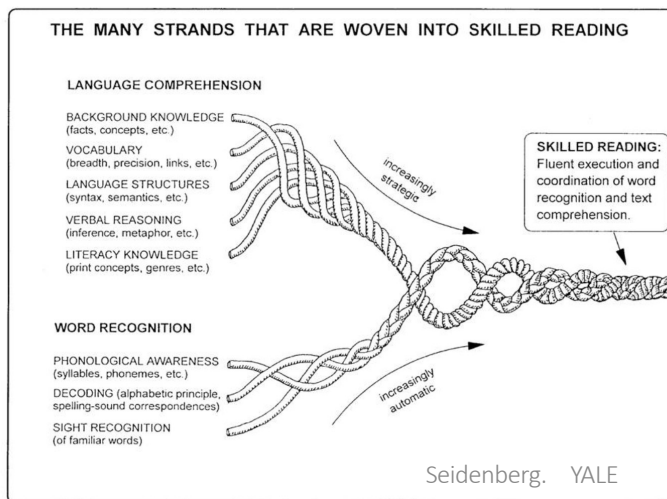
food-heating radio boxes	microwave ovens
tall roads	bridges
the shared space house	international space station
the other worlds around the sun	solar system
planes with turning wings	helicopters
boxes that make clothes smell better	washer and dryer

**The point: Learning about a topic entails learning additional language
Language vs. world knowledge is a false dichotomy..**

9. You're going to need a bigger toolbox.

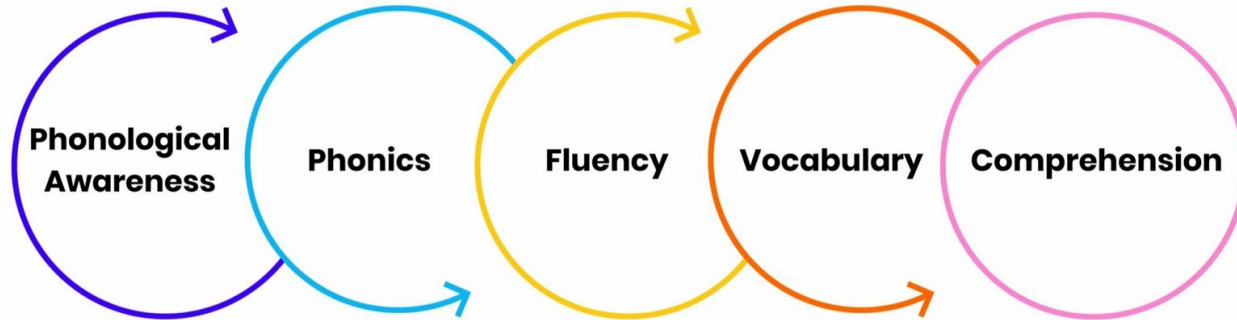


Where's learning?



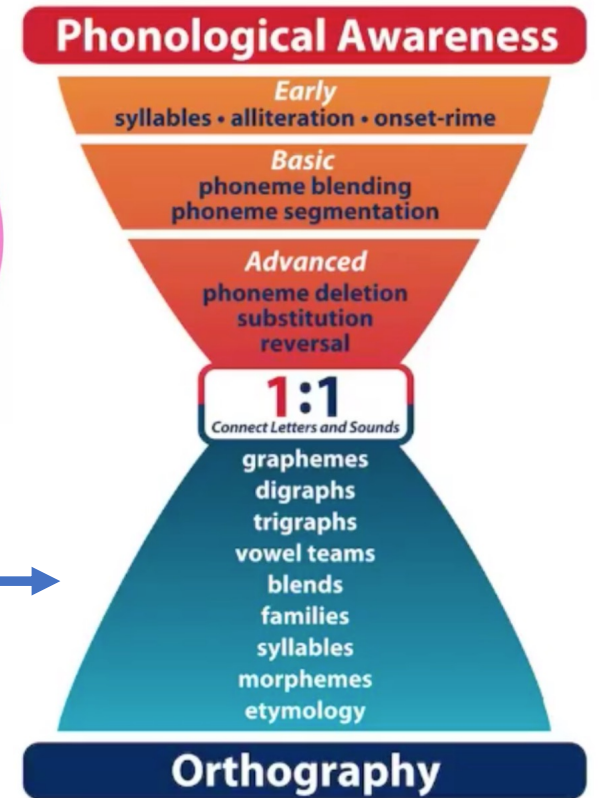
These can be used to justify almost any approach

Pictures like these convey bogus sense of scientific rigor:



Boundaries, people!
Drawings like this falsely suggest that all this stuff needs to be taught.

Author fails to distinguish what teacher needs to know vs.
what reader needs to know



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Summary

Using research on reading and related topics to improve literacy outcomes is still a great idea. And there have been successes. We also want to maintain momentum. But, it has to be effective.

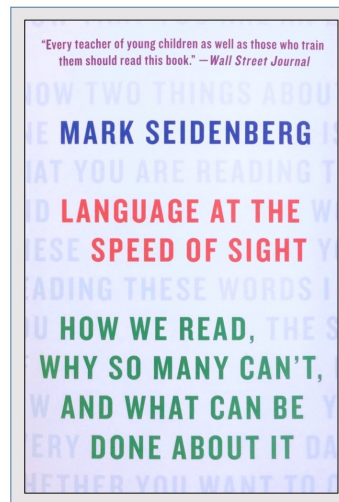
In my view, success is not guaranteed because of the shallowness of the science.

Which is resulting in the adoption of practices that are inspired by research but not closely tied to it.

Practices such as heavy emphasis on explicit instruction exist because the literature hasn't been adequately digested.

Relying on “authorities” is not a good plan, in science or in “the science of reading”

Thank you for listening!



Reading Matters
Connecting Science and Education

Articles and talks available here
Seidenbergreading.com