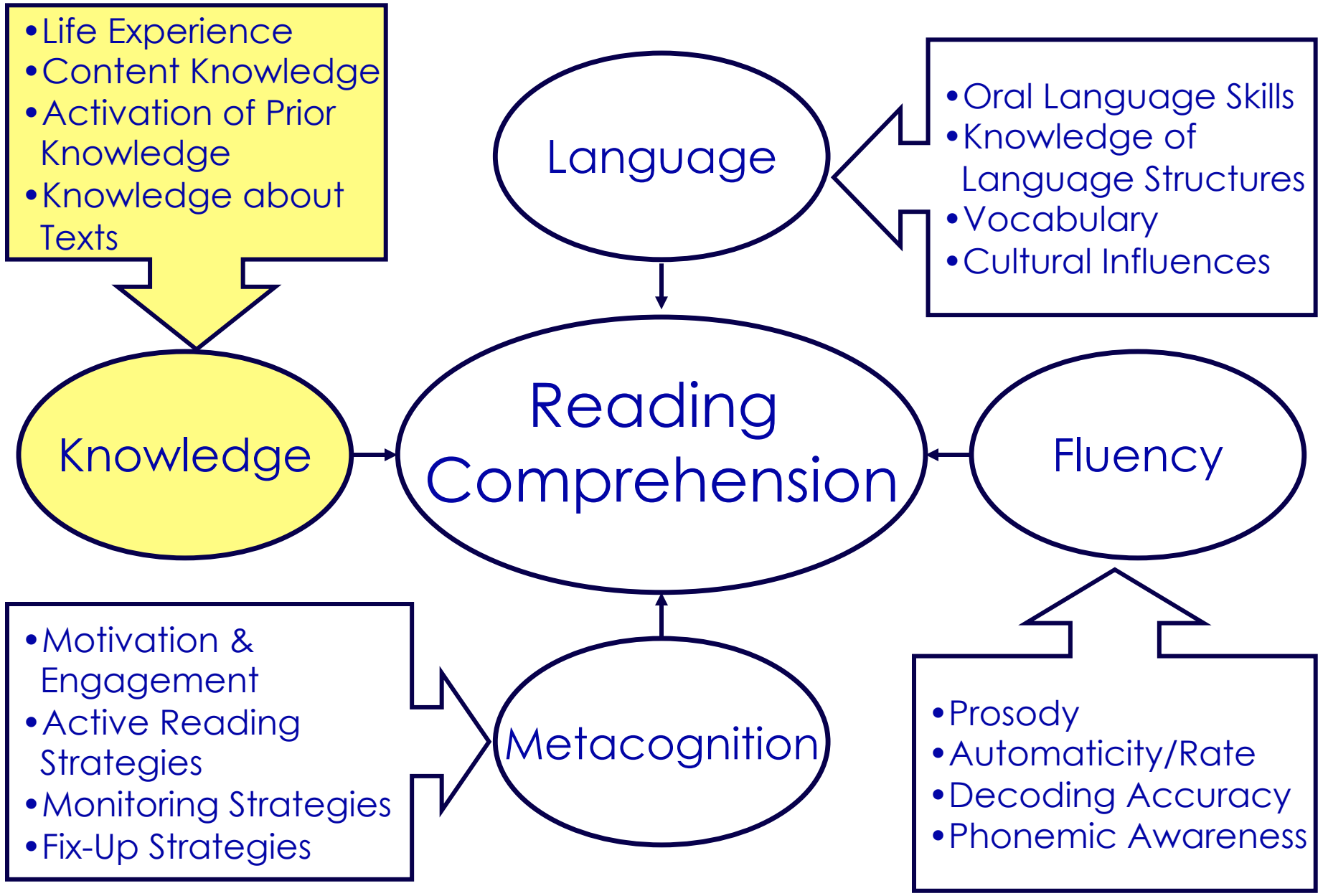
Knowledge



Florida Reading Initiative Conceptual Framework (Lane & Hayes, 2015)

"Good readers know a lot about their world. Let’s not let reading instruction be the enemy of knowledge.”

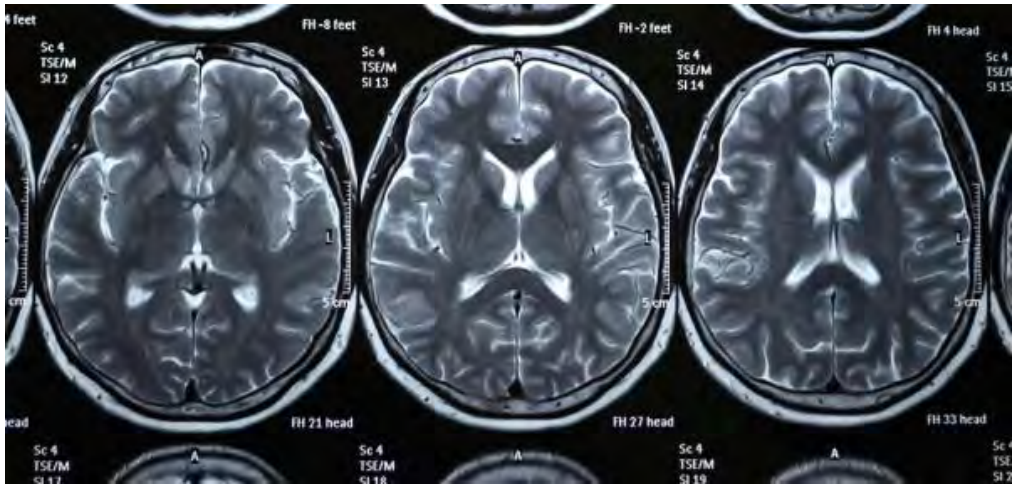
-Timothy Shanahan

The following slides borrow heavily from the work of Dan Willingham..

Why is KNOWLEDGE important?

Bridging gaps…. The brain scan was fuzzy.

The patient must have been wearing make-up.



Brain scans use magnets that react to metal.

Make-up contains traces of metals.

Why is KNOWLEDGE important?

Bridging gaps…..

“I promised not to play with it, but Mom still wouldn’t let me bring my Rubik’s Cube to the library.”

The author has omitted three facts vital to comprehension:

1. You must be quiet in a library.
2. Rubik’s Cubes make noise.
3. Kids don’t resist tempting toys very well.

Why is KNOWLEDGE important?

Providing context…..

Pope Francis Shocks World, Endorses Donald Trump for President, Releases Statement

TOPICS: Pope Francis Endorses Donald Trump

You're less likely to believe this fake news headline…

- if you know anything about the ideological positions of the two men
- if you're aware that no pope has ever endorsed a presidential candidate

Why is KNOWLEDGE important?

The procedure is actually quite simple. First, you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run, this may not seem important, but complications can easily arise. A mistake can be expensive as well. After the procedure is completed, one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually, they will be used once more and the whole cycle will have to be repeated. At first, the whole procedure will seem complicated. Soon, however, it will become just another fact of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one can never tell.

Why is KNOWLEDGE important?

Resolving ambiguity…. A hunter with a shotgun says, “There’s a grouse across that field, maybe 100 yards away,” and his friend says, “Well, shoot!”

What does the friend mean?

Why is KNOWLEDGE important?

Resolving ambiguity…. Background knowledge enables readers to choose between multiple meanings of words…

OPERATION

Why is KNOWLEDGE important?

Making inferences…

John's face fell as he looked down at his protruding belly. The invitation specified ‘black tie' and he hadn't worn his tux since his own wedding, 20 years earlier.

KNOWLEDGE REQUIRED:

- ✓ Tux = tuxedo = expensive suit
- ✓ People gain weight as they age.
- ✓ A tux that fit 20 years ago probably won’t fit now.

Why is KNOWLEDGE important?

Making inferences…

John walked down the steps with care. Jeanine looked him up and down while she waited. Finally she said, ‘Well, I'm glad I've got some fish in my purse.'

KNOWLEDGE REQUIRED:

People liken men in tuxedos to penguins.

Penguins eat fish.

Why is KNOWLEDGE important?

Taking in and making sense of new information…

CN

NFB

ICB

SCI

ANC

AA

Why is KNOWLEDGE important?

Taking in and making sense of new information…

CNN

FBI

CBS

CIA

NCAA

Why is KNOWLEDGE important?

Remembering information…

Sum of Squares and Cross Products

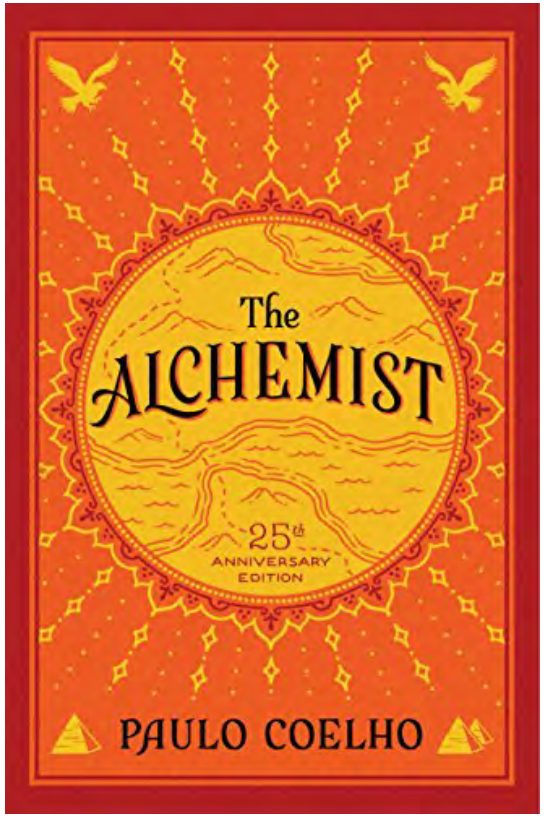
In the univariate analysis of variance, the total sum of squares of the dependent variable is partitioned into two components: pooled within-groups sum of squares and between-groups sum of squares. With multiple dependent variables it is, of course, possible to calculate the within and between sums of squares for each of them. In addition, the total sum of cross products between any two variables can be partitioned into pooled within-groups sum of products and between-groups sum of products.

The Role of Automaticity

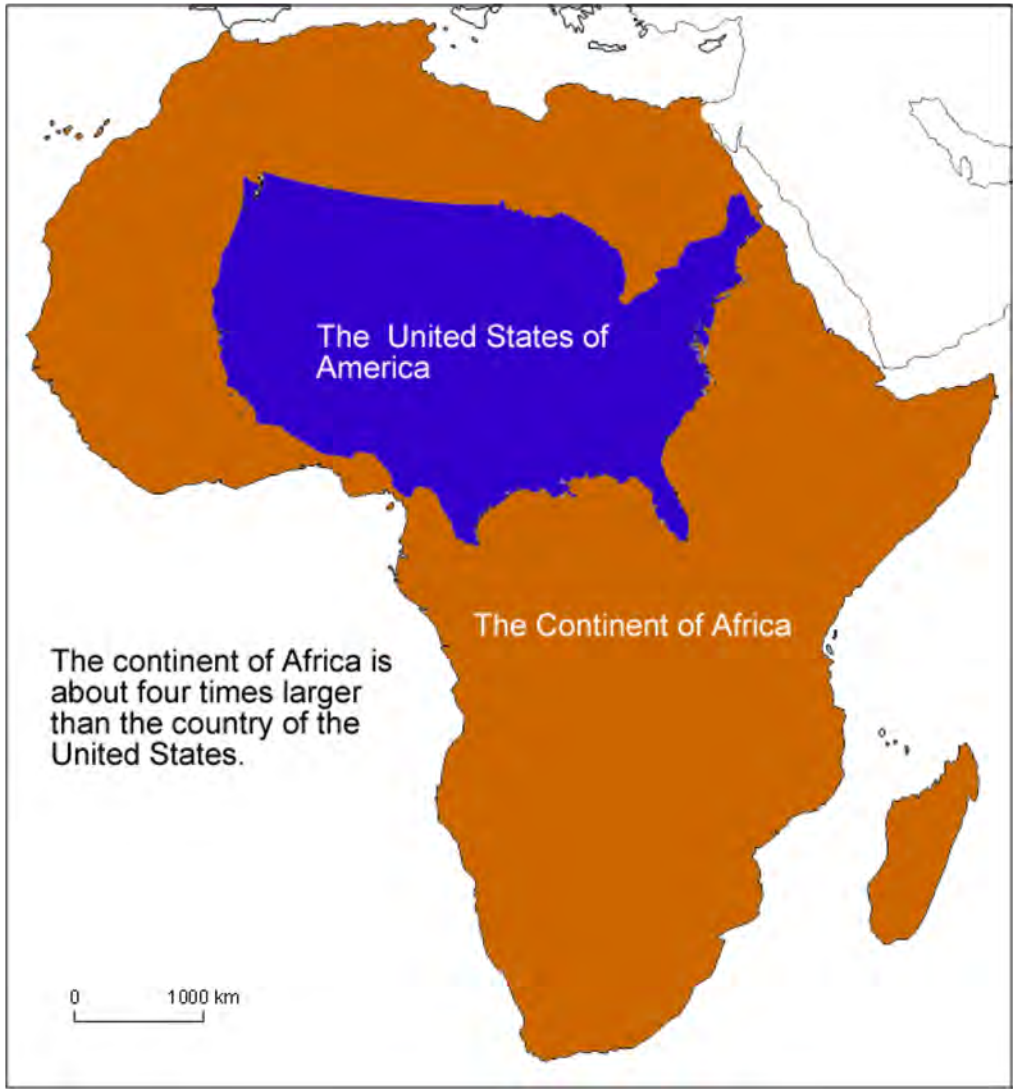
Automaticity is an inherent component of fluency. It involves the ability to identify letters, letter patterns, and isolated words accurately and quickly. Fluency integrates automatic word identification with the application of intonation, rhythm or prosody, and phrasing at the text level. Automatic and fluent reading enhances effective reading comprehension. Fluency frees the reader's attention and cognitive resources to focus on the meaning of the text and allows for more efficient application of higher order thinking skills.

Why is KNOWLEDGE important?

Put simply, the more you know about a topic, the easier it is to **read** a text, **understand** it, and **retain** the information.



Why is KNOWLEDGE important?



Study 1

- Researchers assessed low- and middle-SES children's background knowledge about birds by creating a task with fictional characters and names: “This is a toma. A toma is a bird. Can a toma live in a nest?” and other items in a similar format.
- The experiment revealed stark differences in knowledge about birds between the two groups.
- Low-SES children had significantly more limited background knowledge than their middle-class peers.

(Kaefer, Neuman, & Pinkham, 2015)

Study 2

- To understand how these differences in background knowledge might relate to comprehension in text, the researchers created an 18-page illustrated storybook that featured the adventures of four types of birds (named for extinct species): the moa, faroe, cupido, and kona.
- The book had a total of 238 words and shared a common plot and story grammar, including the setting (i.e., a house), problem, response, and resolution.
- The low-SES children demonstrated significantly poorer comprehension of the story than their middle-SES peers.

(Kaefer, Neuman, & Pinkham, 2015)

Study 3

- In the third study, the researchers attempted to neutralize background knowledge by introducing a storybook narrative context that would be novel to both groups.
- For this study, they created an 18-page illustrated storybook similar to the one they used in the previous study—with one difference: The storybook used a novel category, wugs (a pseudo-word), and was designed around the adventures of four species of wugs.

(Kaefer, Neuman, & Pinkham, 2015)

Study 3 (continued)

- In this case, there were no differences between groups.
- When background knowledge was held constant by introducing an unknown topic, there were no significant differences between SES groups in children's word learning, comprehension, or ability to make inferences.
- Taken together, these results suggest that differences in low-SES children's comprehension skills may be attributed, at least in part, to limitations in their preexisting knowledge base.

(Kaefer, Neuman, & Pinkham, 2015)

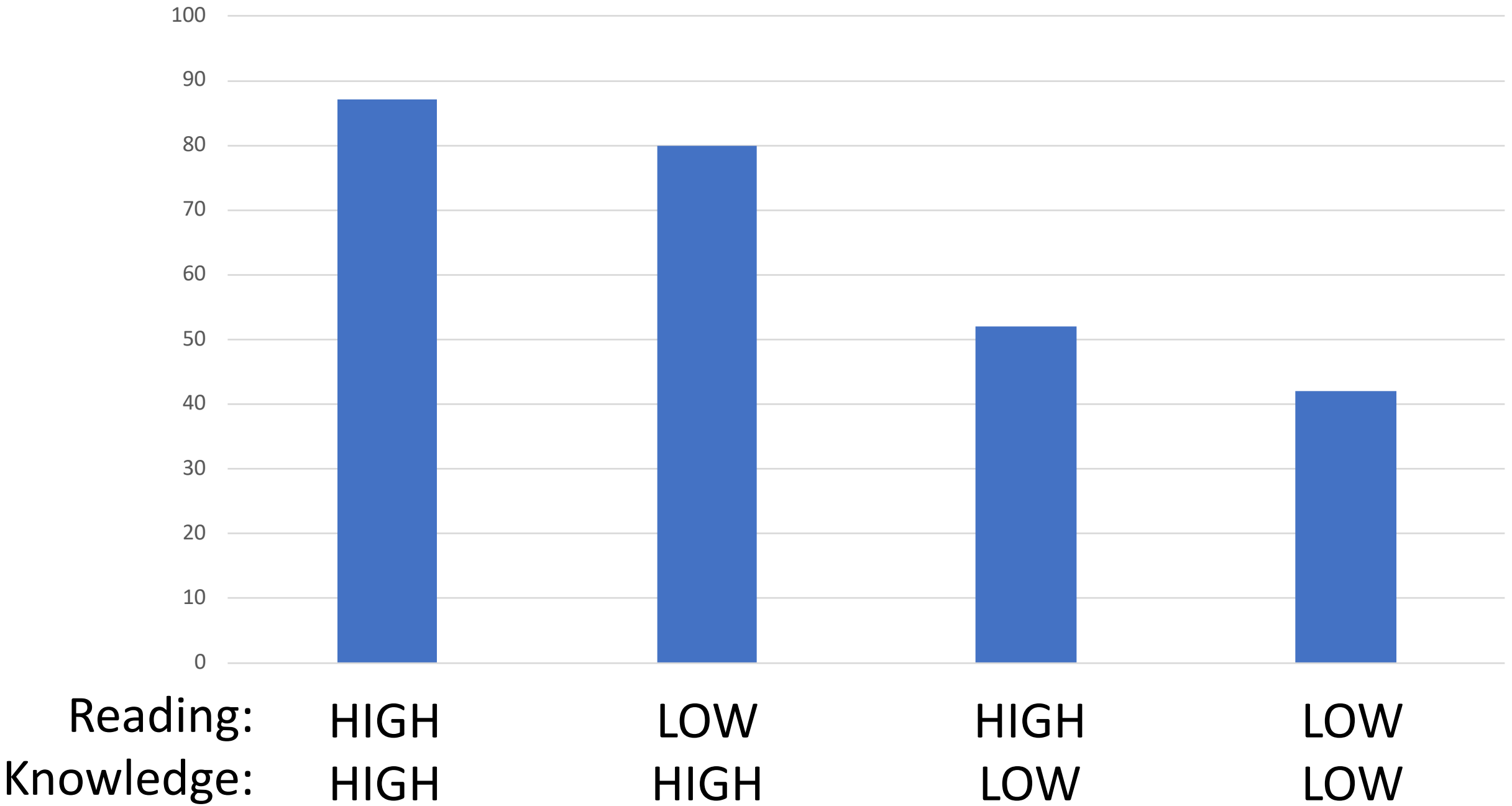
Good Readers vs. Poor Readers

Another study had four groups of seventh graders, based on reading ability and knowledge about baseball:

- good readers who knew a lot about baseball
- good readers who knew little about baseball
- poor readers who knew a lot about baseball
- poor readers who knew little about baseball

(Recht & Leslie, 1988)

Good Readers vs. Poor Readers


100
90
80
70
60
50
40
30
20
10
0
Reading: HIGH LOW HIGH LOW
Knowledge: HIGH HIGH LOW LOW

How do we develop this knowledge?

Children develop knowledge about the world through instruction in content areas, particularly…

social studies and science.

Unfortunately, in an effort to improve reading scores, time spent on social studies and science has declined.

How do we develop this knowledge?

What percent of time in first grade classrooms is spent on social studies instruction?

- **2%**
- 8%
- 12%
- 17%

How do we develop this knowledge?

What percent of time in first grade classrooms is spent on science instruction?

- **4%**
- 8%
- 12%
- 16%

How do we develop this knowledge?

What percent of time in third grade classrooms is spent on social studies and science instruction?

- Social Studies 5%
- Science 5%

How do we develop this knowledge?

What percent of time is spent on language arts instruction?

- First Grade 62%
- Third Grade 47%

How do we develop this knowledge?

Where does all that time go?

- Reading strategies
  - Find the main idea
  - Identify the author's purpose
  - And so on…
- Research demonstrates…
  - Reading strategies do help.
  - But not as much as you'd think!
  - It's a one-time boost, and a lot of practice doesn't help.
  - There's no point in spending more than about 10 lessons on a strategy.

How helpful are strategies?

England’s openers labored 34 balls before scoring their first boundary as Strauss cracked two fours through the leg side. Cook made a patient start before motoring past his skipper.

No strategy will help you understand this if you don’t understand cricket!

Key Take-Aways

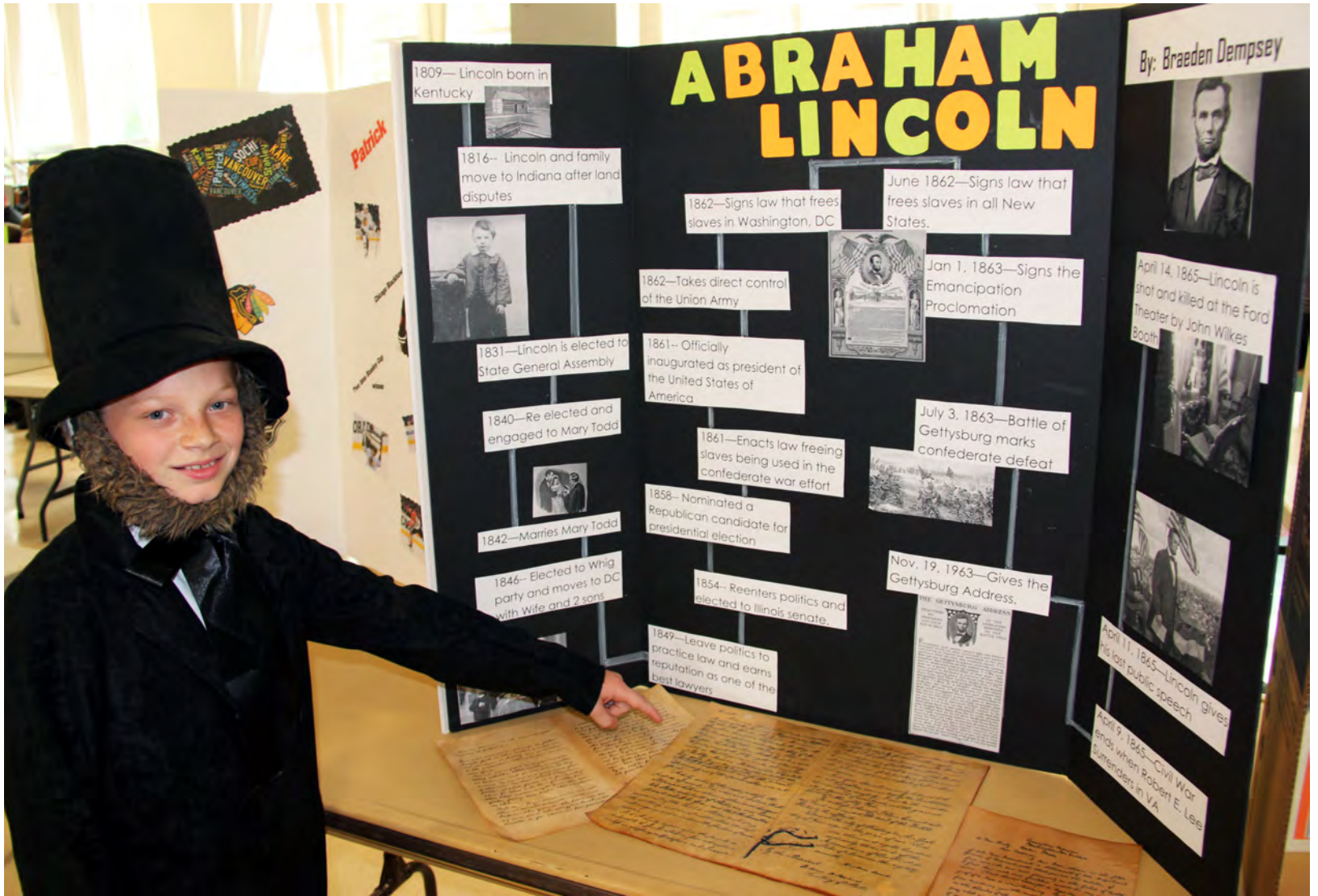
- Once students learn to decode and read text fluently, they can read any text.
- But they can’t understand everything they read. Comprehension relies on prior knowledge.
- Attempts to boost comprehension through reading strategies alone will fail.

So, what can we do??

- Use reading materials that teach students something about the world.
- Don’t neglect other subjects!

Teaching science IS teaching reading.

Teaching history IS teaching reading.



Teaching geography IS teaching reading.

Teaching music IS teaching reading.

Teaching art IS teaching reading.

Teaching civics IS teaching reading.

Teaching theatre IS teaching reading.

Teaching **content** is teaching reading!

How can we make these things happen?

Questions to ponder…

1. What have you learned today that aligns with what you are already doing?
2. What has blown your mind?
3. What barriers or challenges do you foresee in disseminating the knowledge you've gained?

Some Resources

Brain Pop
Magic TreeHouse
Jamestown Readers
Achieve 3000
Reading A-Z
Newbridge
National Geographic
YouTube