

Welcome!



# The Magical Journey of Building the Beginning Reader's Brain

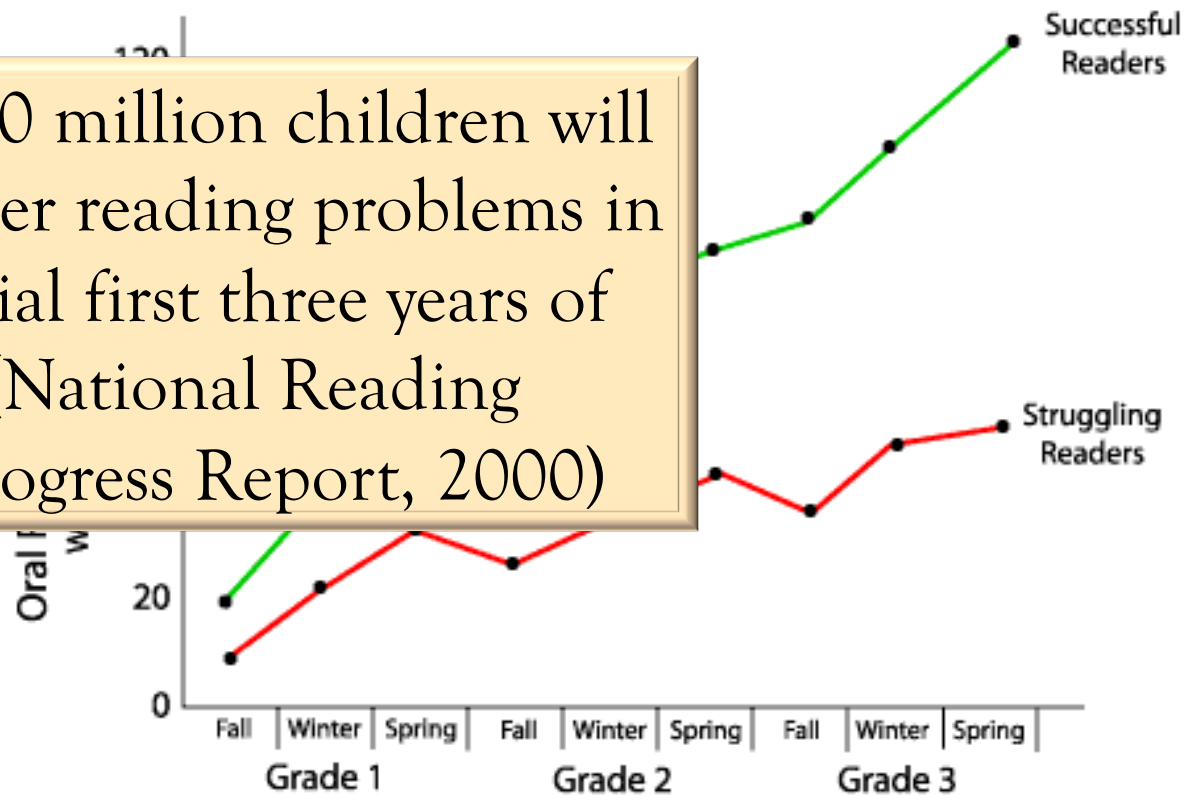


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WCRIS Professional Learning Conference  
August 11, 2017

Future reading progress is set early on...and children who fall behind rarely “catch up” on their own.

Reading Trajectories From Grade 1 to Grade 3

About 10 million children will encounter reading problems in the crucial first three years of school. (National Reading Panel Progress Report, 2000)





# We cannot ignore the facts!



- 36% reading proficiently at 4<sup>th</sup> grade (NAEP, 2015)
- 34% of the fourth grade children across the nation who were reading below the basic level were from homes where the parents had attended or graduated from college (NAEP, 2015)
- 46% meet ACT benchmark level in Reading (ACT, Profile Report, 2015)

# Research shows...



We can **PREVENT** reading failure  
After research-based instruction, the  
percentage of first graders experiencing  
reading failure **can be reduced to 4-6%.**

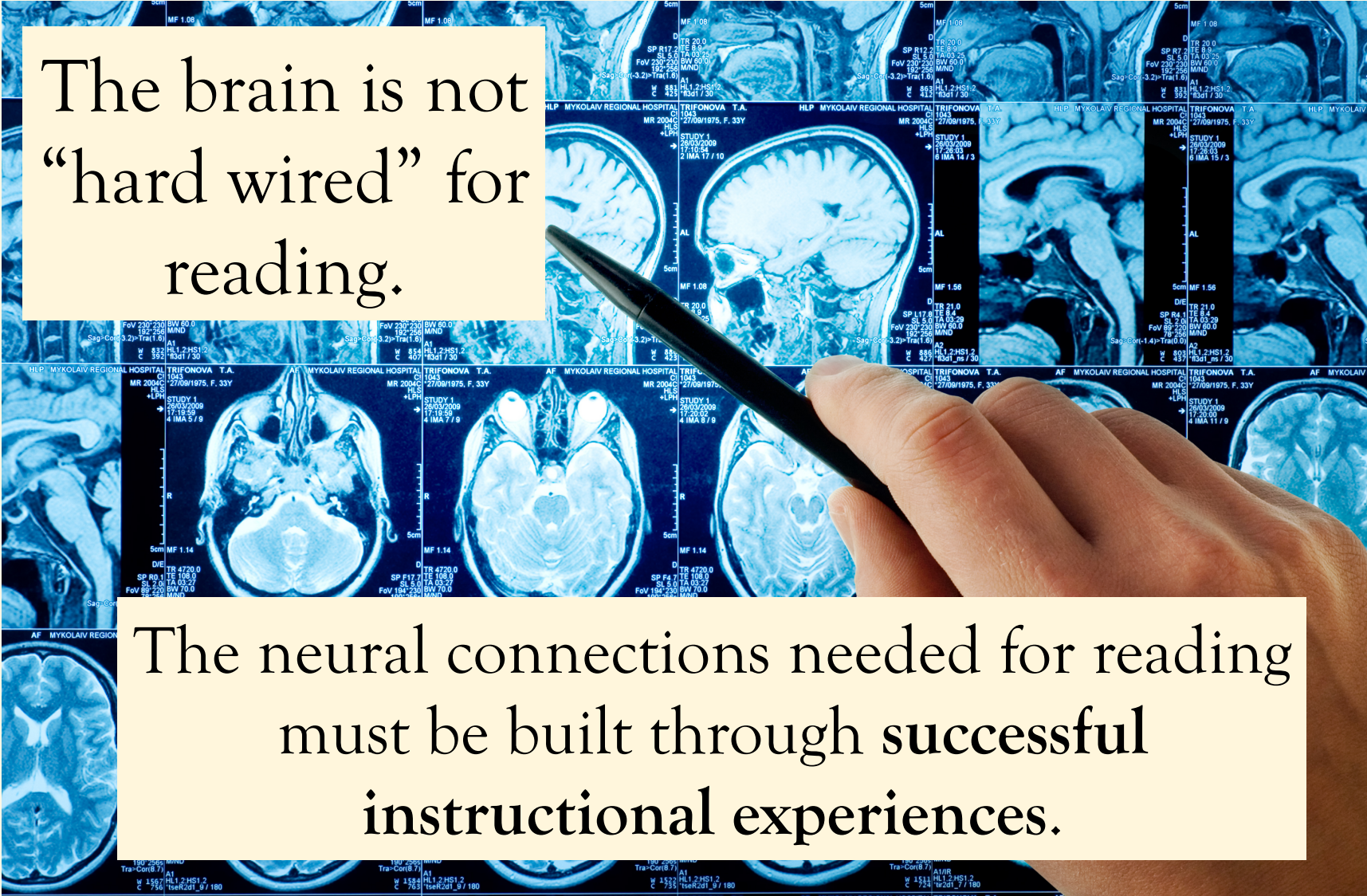
Foorman, Brier, & Fletcher, 2003; Mathes et al., 2005; Torgesen, 2004, 2005).

Significant progress in the area of neuroscience has been made in the past two decades in understanding how reading really works and how we learn to read.





# Preventing Reading Failure: What We Know



The brain is not  
“hard wired” for  
reading.

The neural connections needed for reading  
must be built through successful  
instructional experiences.

# Brain Imaging Studies

MRI measures brain **Structure**  
fMRI measures brain **Function**

1

- fMRI measures blood supply to different parts of brain

2

- When neurons are firing, more oxygenated blood flows to that area

3

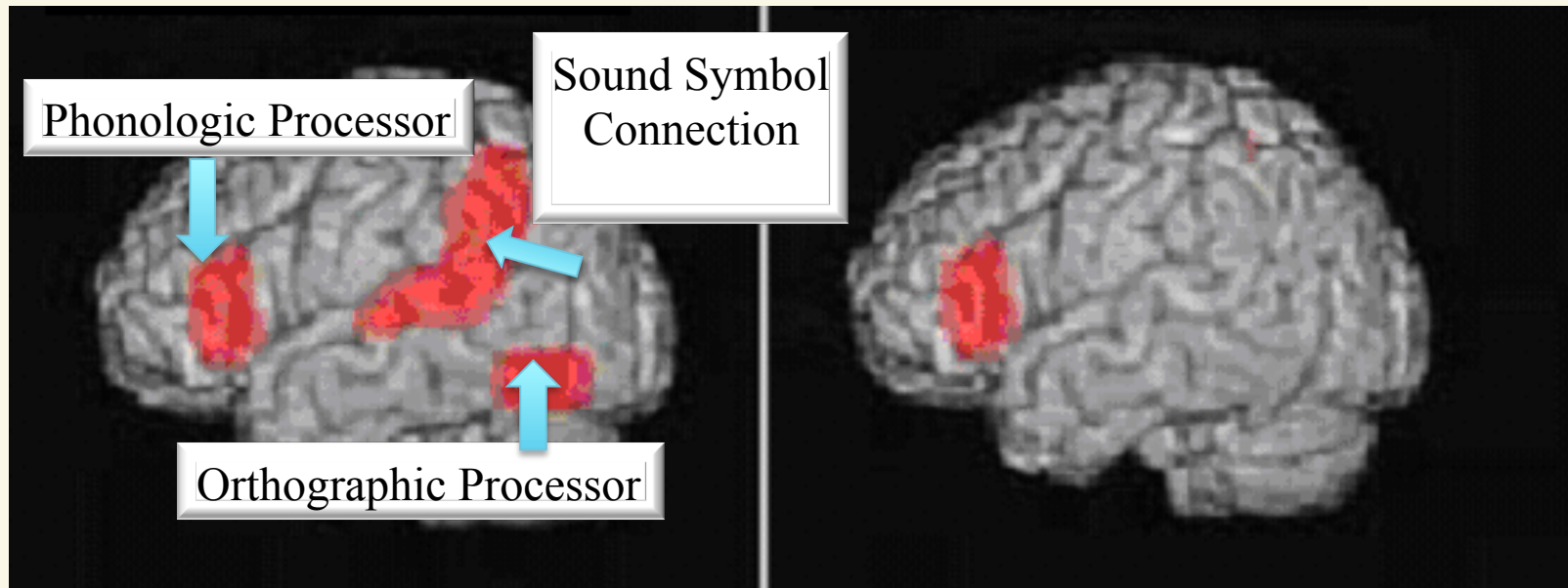
- Iron in blood produces stronger magnetic signal which can be detected





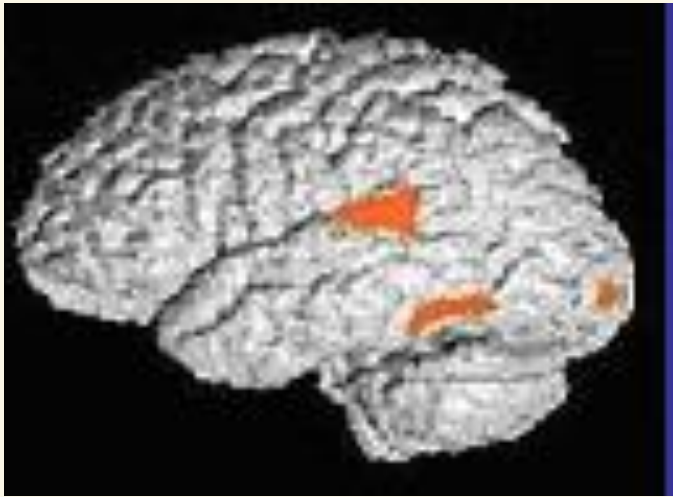
## Fluent Reader

## Beginning Reader



“Within his brain, the child is literally **building the neural circuitry** that links the *sounds* of spoken words, the phonemes, to the print code, the *letters* that represent these sounds” (Shaywitz, 2003, p. 177).

# A Struggling Reader's Brain



Left Hemisphere



Right Hemisphere

# Fluent versus Beginning Readers

*During the pre-reading stage the child's brain takes snapshots of letters and words and memorizes these.*

Look like  
readers



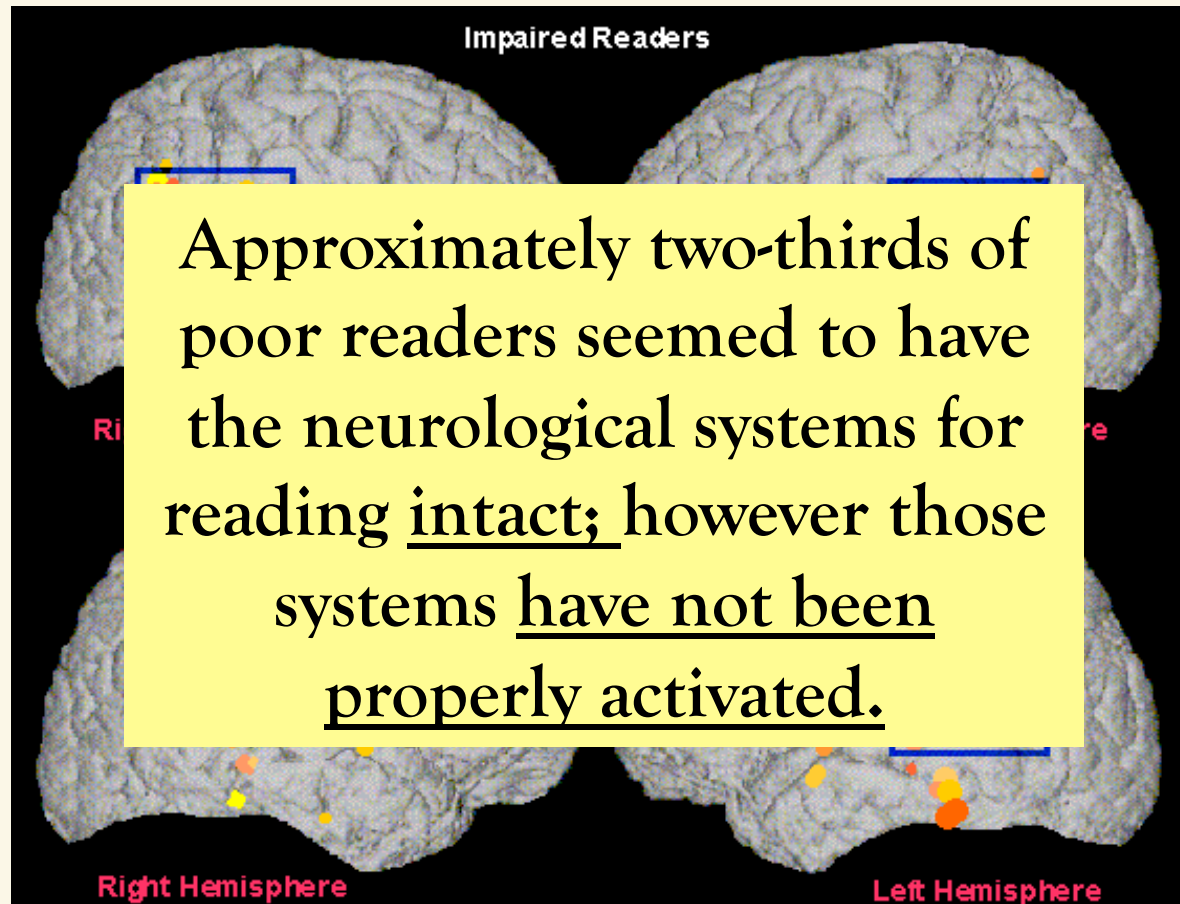
Sound  
like  
readers

Act like  
readers

*This activity takes place in the right hemisphere...in the frontal lobe, an area primarily devoted to memory.*

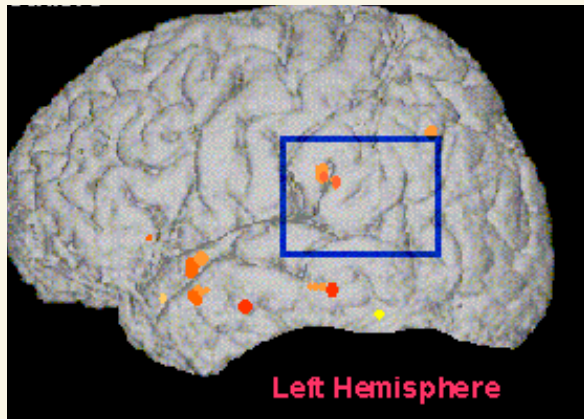
# Reading on the Wrong Side of the Brain

## “Environmentally-influenced” Dyslexia



Simos, Fletcher, Bergman, Breieretal, 2002; Shaywitz, 2003.





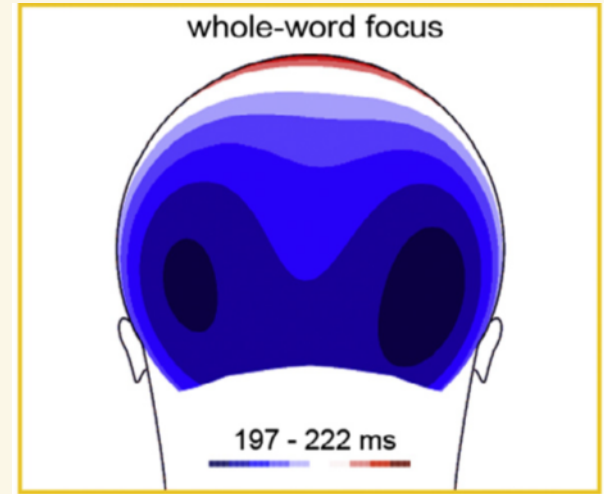
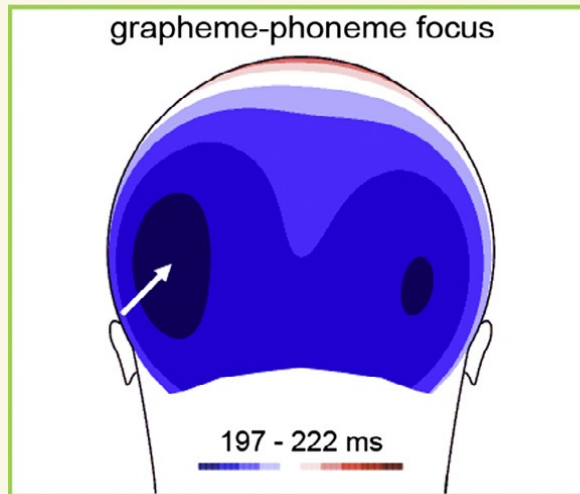
“These persistently poor readers have a rudimentary system in place, but it’s not connected well. They weren’t able to develop and connect it right because they haven’t had that early stimulation. **If you can provide these children early on with effective reading instruction, these children can really learn to read.**” (Shaywitz, 2002).



# Teaching Method Influences Brain Activity

Increased  
speed of  
recall

Increased  
brain activity  
in the left  
hemisphere.



Teaching students to sound out /c/ /a/ /t/ sparks more optimal brain circuitry than instructing them to memorize the word “cat.”

# Dolch Words

is  
did  
a  
at  
got  
it  
its  
sit  
fast  
if  
off  
I  
get  
let  
tell  
had

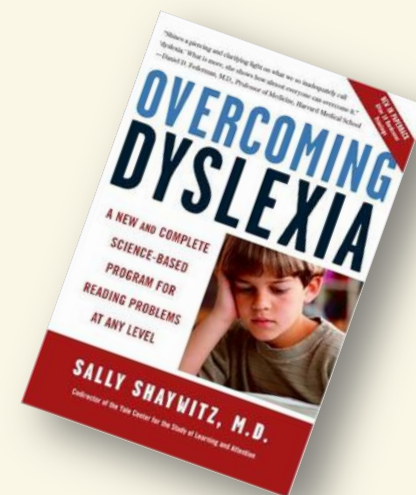
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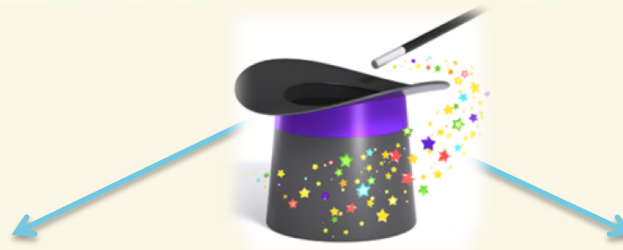
not  
on  
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run  
ten  
no  
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must  
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help  
pull  
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up  
upon  
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seven

into  
well  
went  
will  
to  
ask  
black  
drink  
pick  
like  
jump  
just  
said  
six  
yes  
you  
was



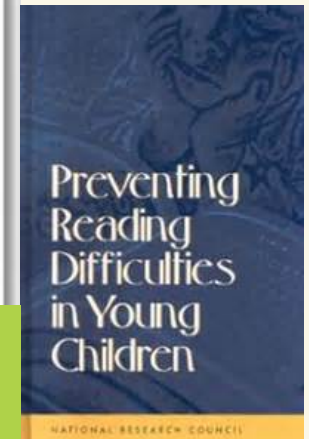
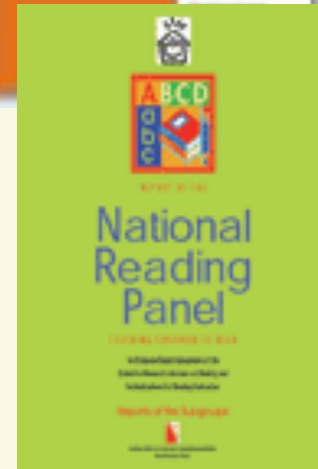
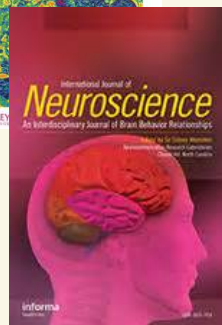
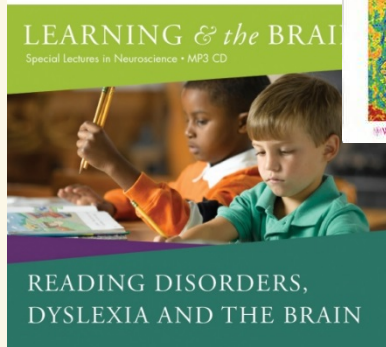
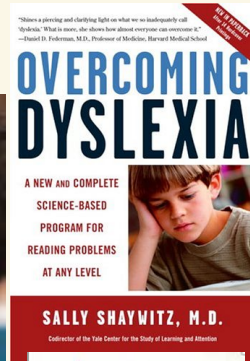
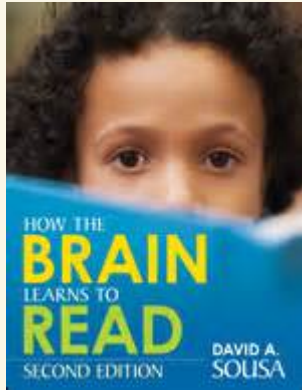
While a rote-based type of learning involving memorization of sight words can get the student to a certain point, eventually there is too much to memorize and the system fails. (Shaywitz et al., 2002)





# Neuroscience

# Educational Research



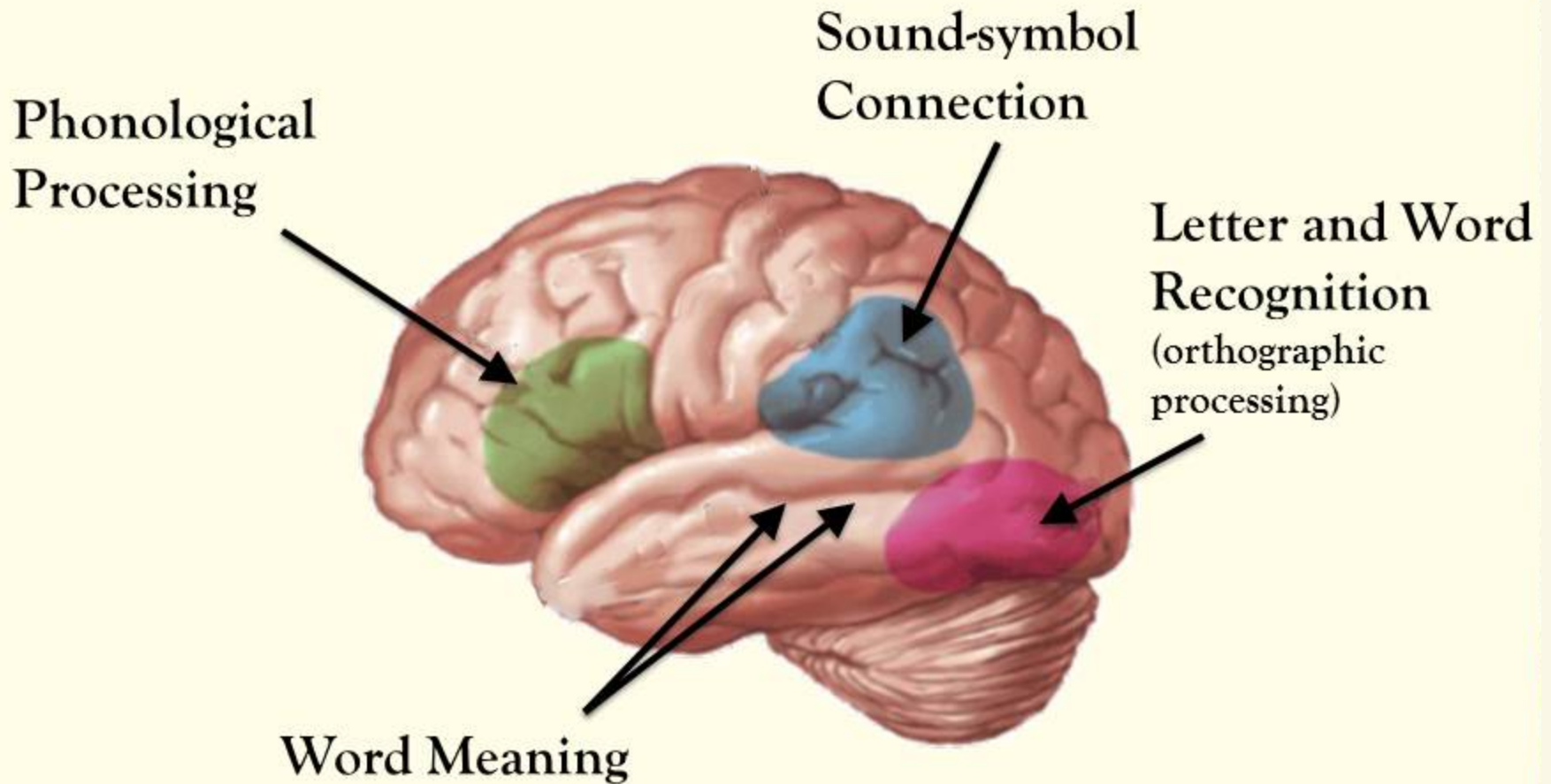


# Beginning Readers Need Systematic and Explicit Phonics Instruction

- ★ 3 decades of research funded by National Institutes of Health
- ★ 10 large scale longitudinal studies & 1,500+ smaller-scale studies
- ★ 10,000,000+ children studied
- ★ 2,500+ articles & 50+ books

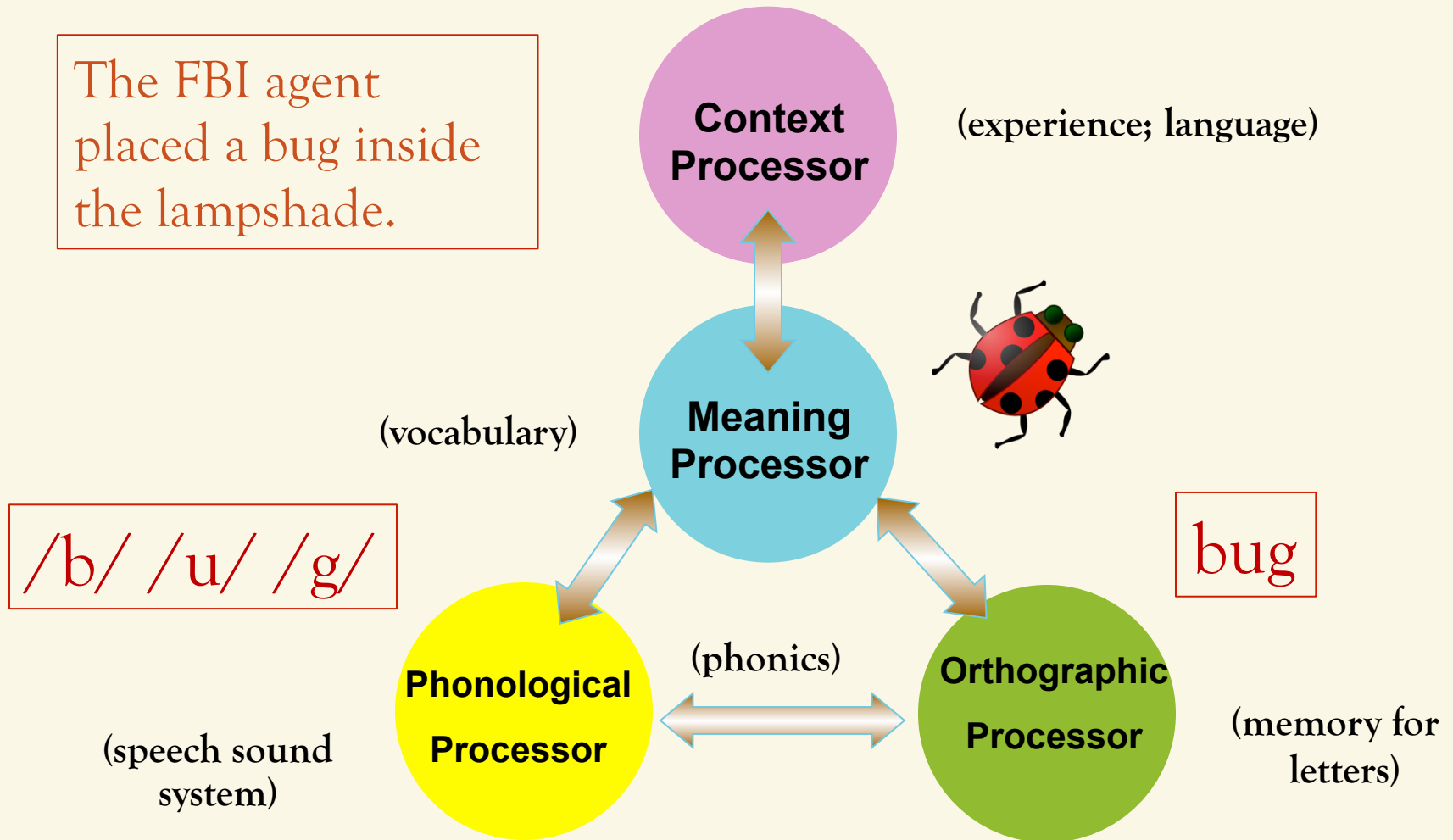


# What the Brain Must Do to Read Words



# Four-Part Processing Model

Seidenberg and McClelland, 1989





# What Do Beginning Readers Need to Do?

- **Decode** = Link sounds to the printed letters, blending them together, and saying the whole word.
- **Encode** = Translate speech sounds into the letters that represent those sounds



# How Do Children Learn To Read?

Reading is a product of:

- Decoding (word recognition)
- Language comprehension



Working memory



Less fluent reader



More fluent reader

 Decoding (word recognition)

 Language comprehension



# Predictable Progression of Skills



Decoding (word recognition)



Comprehension

- ★ Phoneme awareness
- ★ Letter recognition, naming, formation



- ★ Letter-sound association (phonics)
- ★ Blending
- ★ Decoding (and encoding)
- ★ “Memory” words



- ★ Oral language
- ★ Vocabulary
- ★ Listening comprehension



Automaticity ➡ Fluency ➡ Text Comprehension

Effective phonics instruction includes  
sufficient practice in decodable texts



*“As an instructional strategy, the teaching and  
the text cannot be separated.”*

# Text Matters!

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Collectively the results indicate that decodability is a critical characteristic of early reading text as it increases the likelihood that students will use a decoding strategy and results in immediate benefits, particularly with regard to accuracy.

# What do I do with this word?

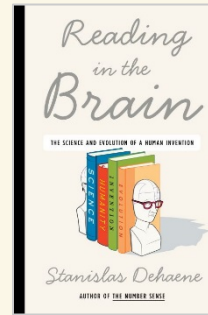
Teaching children to guess at words that they do not recognize immediately is never acceptable (Sweet, 2015).





“The lesson-to-text match is *pivotal* to the successful use of decodable text.”

-Mesmer, 2001

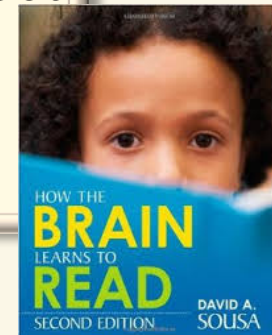


“..the words and sentences introduced in class must only include graphemes and phonemes that have already been taught.”

- Dehaene, 2009

“Practice materials should include stories that contain words using the specific letter-sound correspondences the children are learning.”

- Sousa, 2014



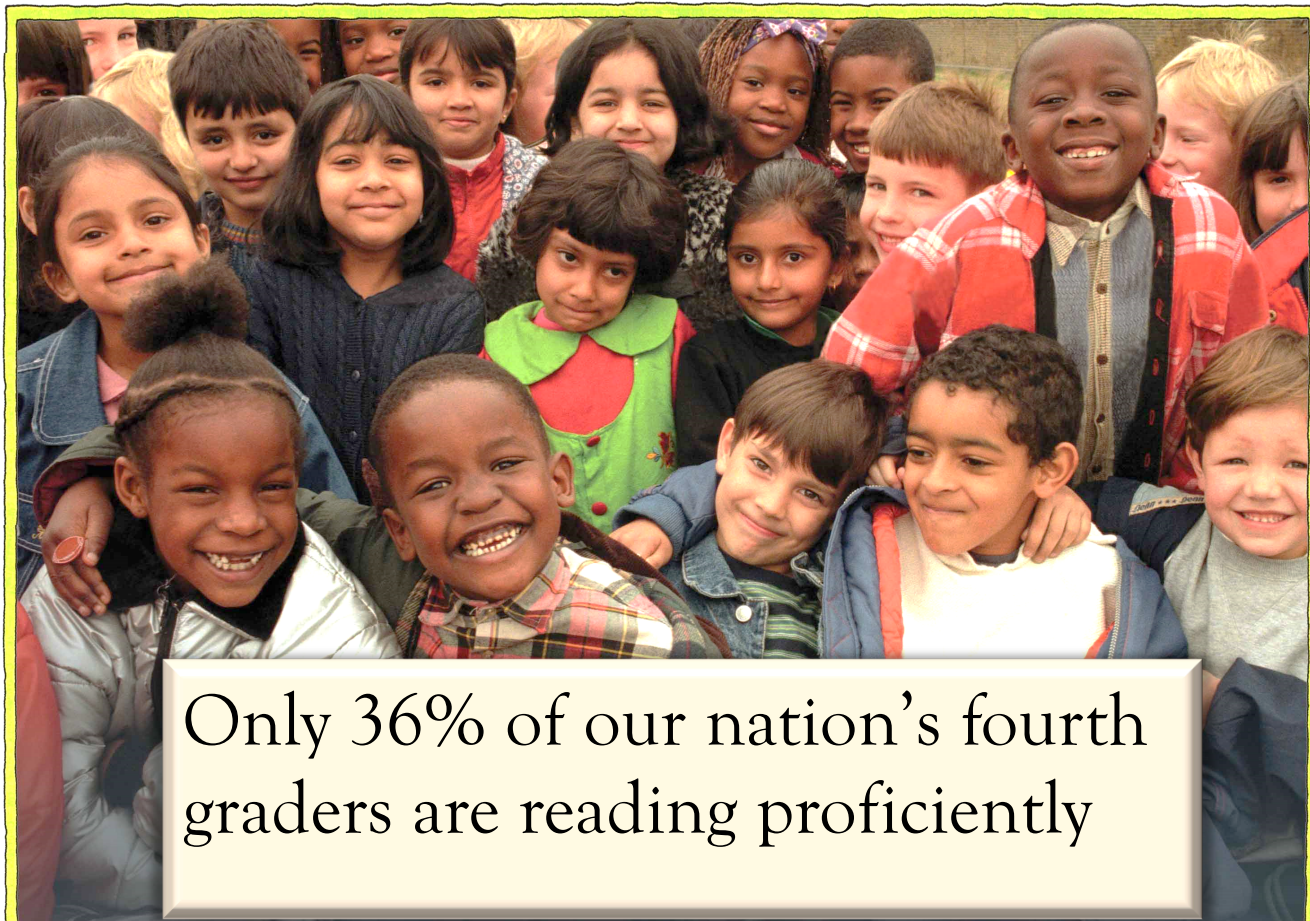
# What makes decodable text *decodable*?

- ★ High proportion of words with phonetically regular relationships between letters and sounds
- ★ Close match between the letter/sound relationships represented in text and those that the reader has been taught

*In a class of 24 kindergarten students, about how many:*

- ★ Will come to school already reading?
- ★ Will learn to read regardless of the instructional approach that is used?
- ★ Will require systematic, explicit, and supportive instruction, as well as additional opportunities to learn?
- ★ Will require systematic, explicit, and supportive instruction, with intensive opportunities to learn?
- ★ Will have a reading disability and require special education services?

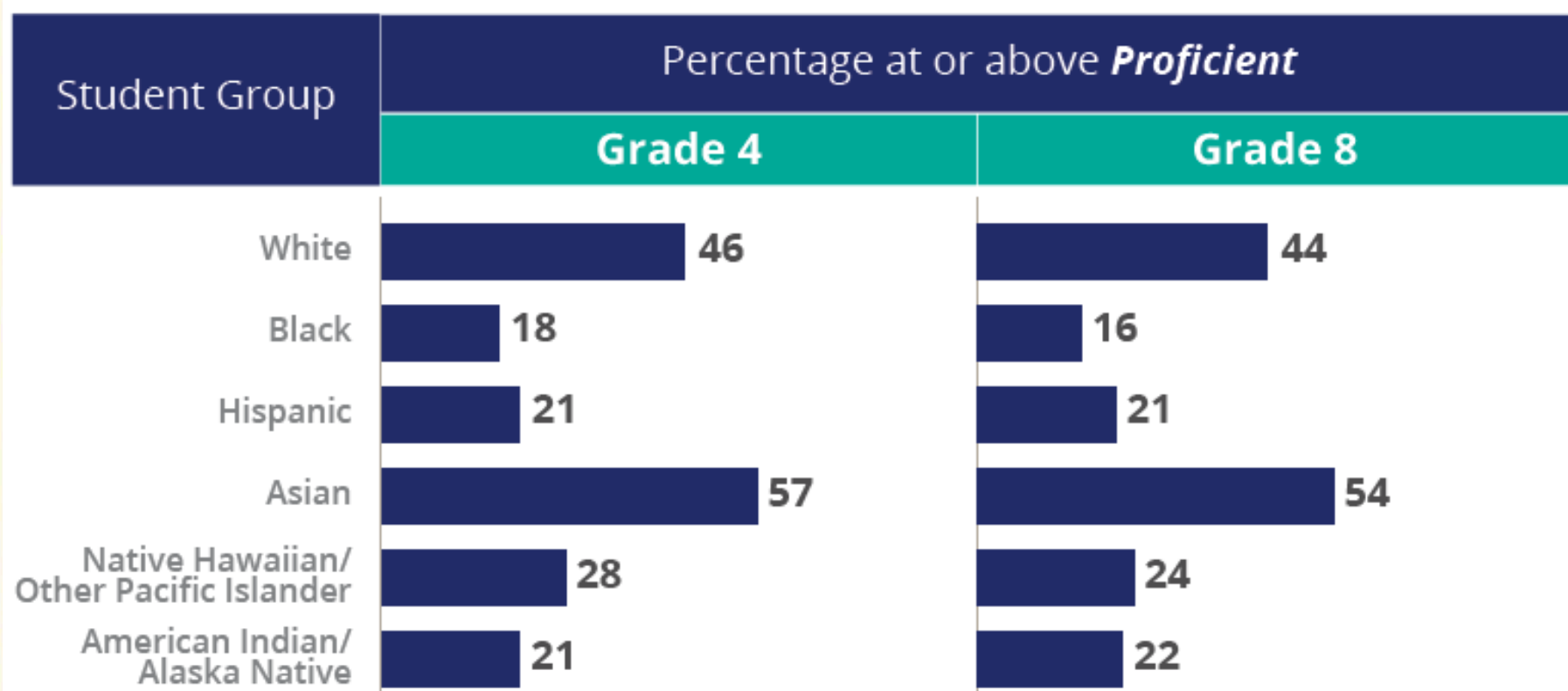
# What Will Happen to These Children by Grade 4?



Only 36% of our nation's fourth graders are reading proficiently



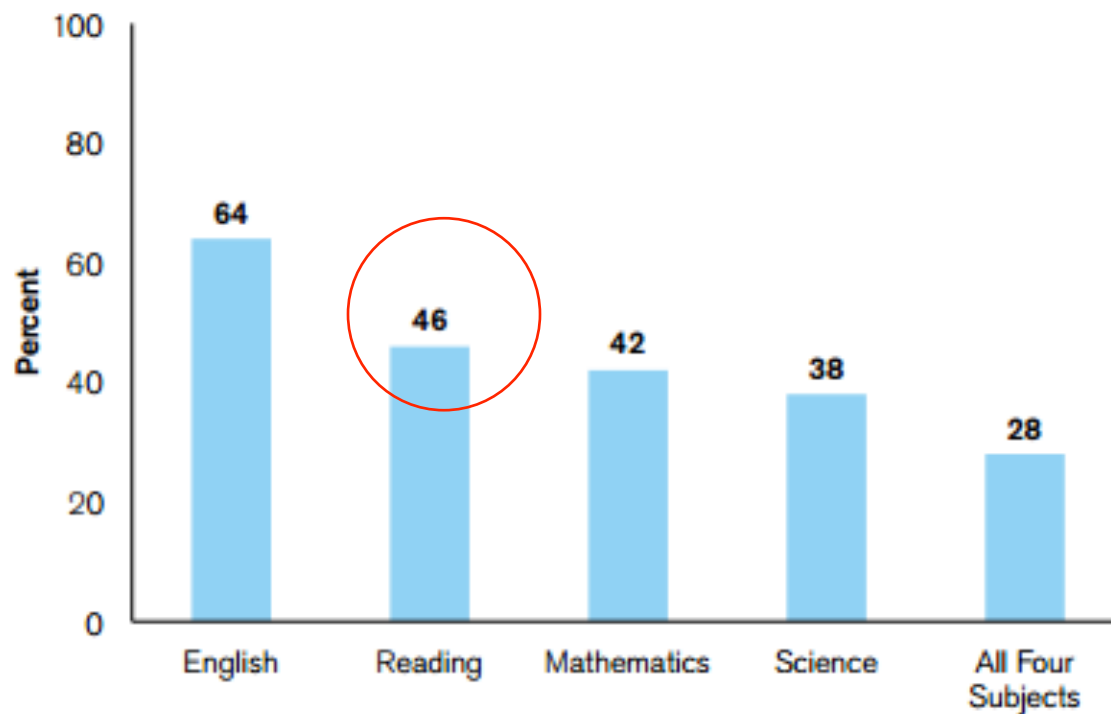
# NAEP 2015



- 34 percent of the students across the nation scoring below the basic level were from homes where the parents had either graduated from or attended college.

Less than half of our high school students, nationwide, meet the recommended benchmark levels in Reading on the ACT. (ACT, 2015)

**Percent of 2015 ACT-Tested High School Graduates Meeting ACT College Readiness Benchmarks by Subject**





Thank You!



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