Why is learning to read sometimes so difficult?

by

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This blog is a four-part series, in which we will explore the mechanics of reading, scientific advances in understanding what happens in the brain while reading, and lastly, suggestions for activities and accommodations for struggling readers.

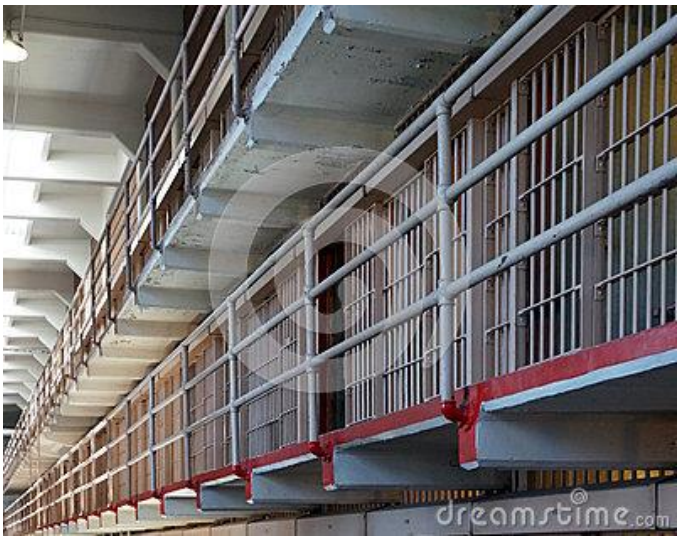
PART ONE: BASIC READING MECHANICS

We live in a literate intensive society. Reading is all around us, we are surrounded by words everywhere we look. Even our phones require reading skills.

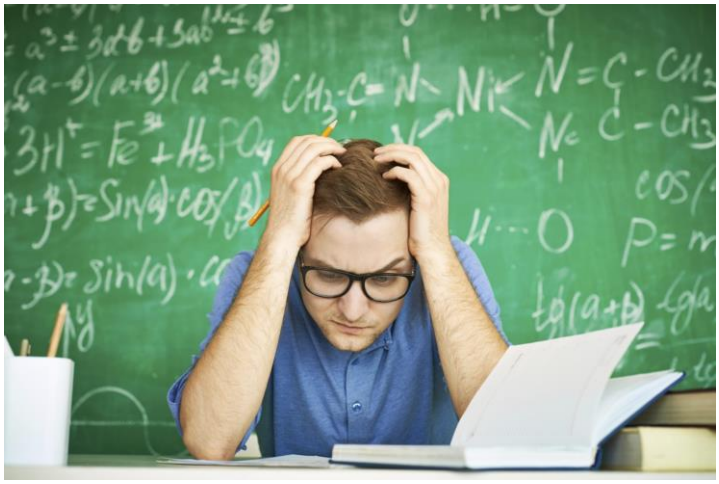
In 1852, Massachusetts was the first state of the union to pass compulsory education laws. By 1917, every state in the union had passed compulsory education laws.

Unfortunately, many laws were not enforced. The value of compulsory education was not recognized as important or economically valuable or feasible. Secondly states, religious organizations, and individuals constantly attacked the laws as unconstitutional. It wasn't until the 1970's that the all issues and frivolous lawsuits were finally resolved and compulsory education became the law of the land. Every child is required to receive some sort of schooling, whether it was public, private, religious, or home schooling.

This means every child goes to school. Did you know that between 70 and 80% of all incarcerated individuals are functionally or totally illiterate. Since all of these people had to attend school, why can't they read?



People who struggle with reading or who are functionally illiterate, often feel embarrassed or ashamed, or believe they are less intelligent and less capable. The world can be a frustrating place for someone who can't read.



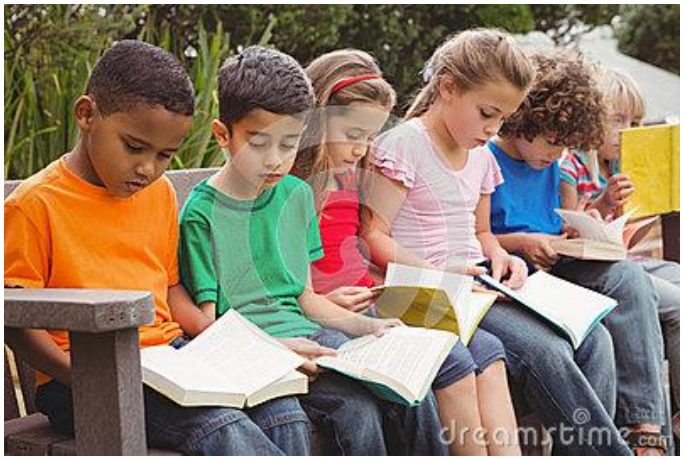
What makes learning to reading so difficult? Reading is not an innate skill. Unlike learning to talk and understand speech, reading does not occur naturally. Reading must be taught. In order to learn to read, we must learn to use our brains differently than in learning to use and understand speech.

So let's take a look at what reading is. Reading is the translation of speech into written symbols, which, when deciphered, can convey information and ideas. Reading involves the coordination of sight, perception, logic, and comprehension. The child must be able to see the symbols, relate the symbols to sound, and then be able to logically connect the symbols with the sound and the meaning of the sound as it relates to speech. When you think about it, that is a tall order for a 6-year-old!

In order to read, children must develop the awareness of the relationship between sounds and speech and the symbols we use to represent them. This process is known as Phonemic Awareness. The word segment "phon" relates to "sound" (think: *microphone, telephone, phonograph*, etc.). Phonics is the study of sound and its relationship to symbols. A phoneme is the smallest unit of sound in speech. Phonemic awareness is the ability to relate a sound to its symbol.

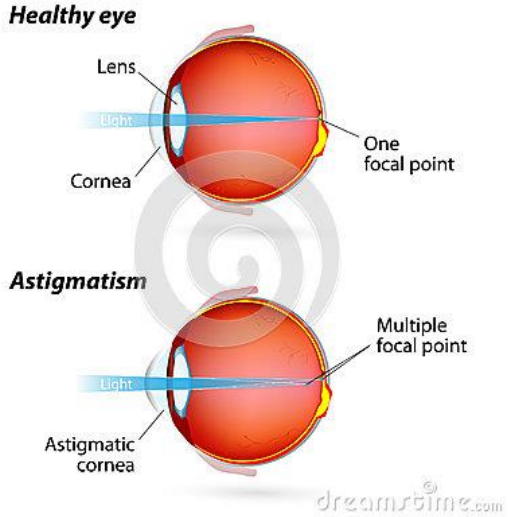
Children who struggle to read or who are dyslexic, have to be taught to read in a different way, in order to change the way their brains work. They have a disconnect in understanding and applying the symbol-sound relationship.

The capable reader is able to easily learn the connection between sounds and their symbols. The capable reader enjoys reading. When children enjoy reading they read more often, and they continue to become even better readers.



We often think that if children have normal vision, they should b able to learn to read because they can see the words and letters. There is a difference between sight and visual perception. Visual perception is the understanding, discernment, and awareness of what is seen. Sight requires the physical structures of the eye and optic nerve to be intact and functioning properly. Visual perception requires the brain.

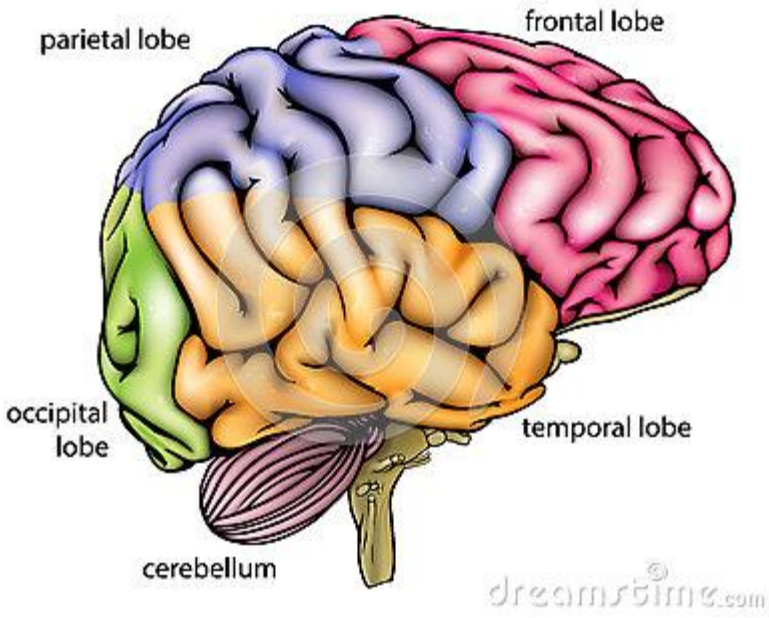
The eye is really like a camera, it is a device for capturing images. The eye does not analyze or interpret, it simply transmits images to the optic nerve. The optic nerve is actually an extension of the part of the brain known as the Occipital Lobe. It is in the brain where visional perception occurs, not the eye. Evidence that we don't use our eyes to read is the fact that a blind person uses their fingers when reading Braille. It can safely be said that reading is a sensory-motor activity that takes place in the entire brain.



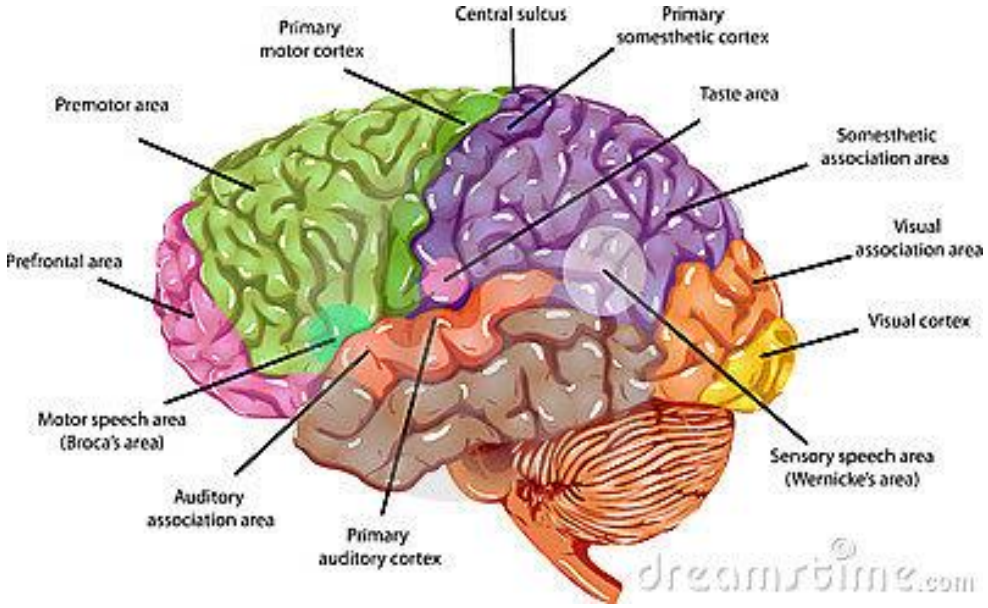
PART TWO: THE READING BRAIN

We have learned more about the human brain in the past decade than at any other time of modern scientific study. While many major discoveries have been made about the brain, as early as the 1800's, how the brain actually works has eluded us.

Over the years, scientists have identified areas of the brain responsible for various functions. The brain is divided into two sides, called hemispheres, and each hemisphere is divided into areas called lobes. The lobes are separated by natural fissures. Both hemispheres have the same basic physical structure, but each area has been shown to have different functions and slightly different internal structures.



Scientists have been aware that areas in the left hemisphere are major centers for speech and language since the late 1800's. These are known as Broca's area and Wernicke's area.



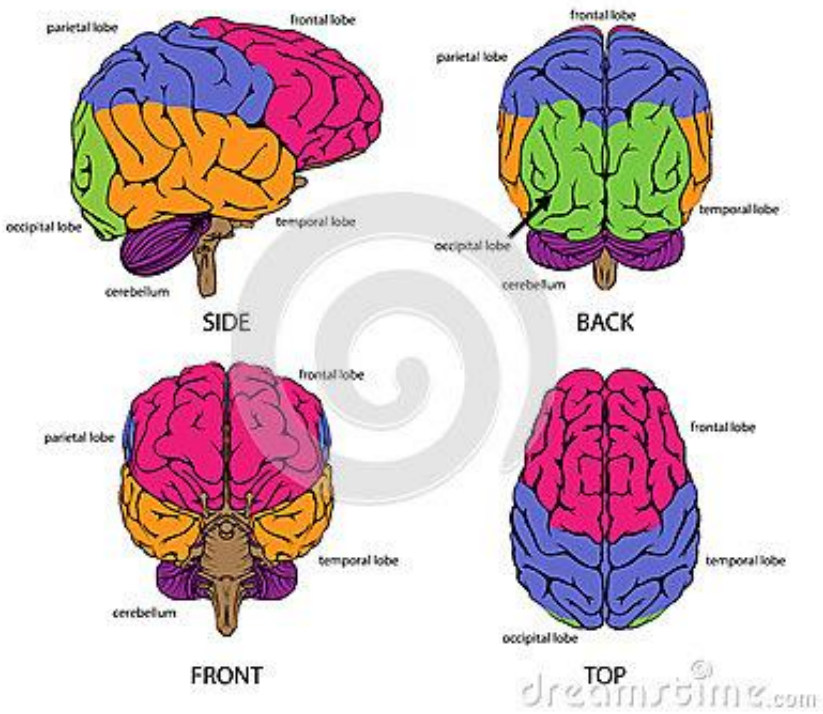
What happens in the brain of a child who is a capable reader? The eye sends an image along the optic nerve to the occipital lobe. The neurons fire and send an impulse deep within the brain to the sensory-motor area, which acts like a switching or relay system. Those neurons fire and send an impulse to the speech and language areas. The impulse is then relayed to other areas of the areas of the brain and the frontal lobe, where the child can now comprehend the symbol. The frontal lobe is the part of our brain responsible for judgment, impulse control, problem solving, and higher-level thinking. All of this activity occurs in one-thousandth of a second or less.

What happens in the brain of a child who is a struggling reader or who is dyslexic? Like the capable reader, the eye sends an image along the optic nerve to the occipital lobe. The neurons fire and send an impulse to the switching station. But this is where the breakdown occurs. The impulse is not sent to the speech and language center of the left hemisphere. Instead, the impulse is sent to the right hemisphere.

Unlike the left hemisphere, which is dominant in processing language and hearing, word analysis, order and pattern perception, details, and linear/logical thinking, the right hemisphere is more concerned with spatial abilities, abstract thinking, understanding the "big picture", facial recognition, making comparisons, non-verbal communication, and interpreting language context and tone.

Sometimes, depending on the individual brain, the impulse is relayed back to the sensory-motor, then to the speech and language areas, and finally to the frontal lobe. This results in a delay in interpreting the symbol and by the time the impulse reaches the frontal lobe, comprehension has been lost. In other individuals, the impulse never arrives at the speech and language area and the meaning of the symbol is simply lost.

Reading involves the entire brain. The ability to make the connection between symbol, sound, and speech is crucial.



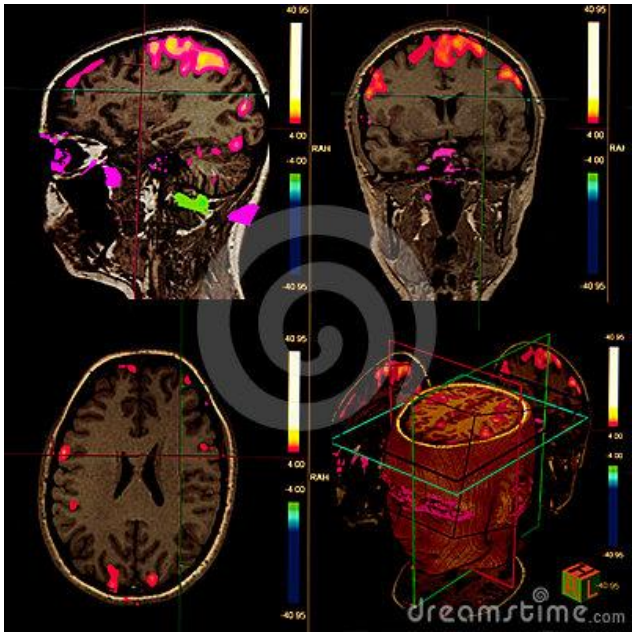
PART THREE: SCIENTIFIC ADVANCES IN UNDERSTANDING THE BRAIN

Our brains are a collection of specialized, interconnected cells, called neurons. Neurons create and receive electrical impulses. Our brains receive information from our bodies through our network of nerves and our brains send information out to our bodies. We are electrical beings.

Scientists once believed that the brain could not change and could not create new neural pathways or new neurons. Science has now discovered that the brain is capable of changing, redirecting pathways, creating new neurons, and changing how different areas function in response to the needs of the body. This is known as the "plasticity theory" of the brain; the concept that brain development is fluid and changeable.

Plasticity of the brain has tremendous implications for helping struggling and dyslexic readers. The brain can relearn where it sends neural impulses and it can also become more efficient with the pathways it is using.

Thanks to functional magnetic resonance imaging (fMRI),we can watch the brain work in real time. fMRI allows us to detect brain activity by measuring changes in blood flow. When an area of the brain is active, blood flow to that area increases. We have physical proof that the brain changes, grows, and creates pathways as we experience reading. fMRI has shown us that our brains actually light up when we think.



Using fMRI, scientists have discovered that as we read words with strong odor associations, regions in the brain related to sense of smell light up. When words related to movement are read, parts of the brain related to that movement light up. For example, in the phrase in "he moved his arm", areas in the brain related to arm movement light up. These types of events occur easily for the capable reader.

The capable reader is actually experiencing what is being read. However, the struggling or dyslexic reader does not find reading enjoyable because this type of interaction between print and thought is not available. The struggling reader is trying hard to decode the symbol and reading is a labor-intensive marathon of deciphering rather than experiencing.

Because the brain of the struggling reader and the dyslexic child is wired differently, struggling and dyslexic readers require an intensive, multi-sensory, strategic, structured, phonetic, step-by-step, creative, and varied approach to reading instruction. Instruction must be explicit, relevant to the needs and age-levels of the students, and must continue at all grade levels. It should be systematic, direct, sequential, and cumulative. Instruction for struggling readers must include understanding of word structure, word patterns, grammar, sentence structure, language usage, and idioms.

When this type of reading instruction is provided in the classroom, every child reaps tremendous benefits. Learning is enhanced for everyone. However, the struggling and dyslexic reader will continue to require more individualized and intensive instruction than the natural or more capable readers.

Every child has the capacity to learn how to read. Every child has the basic right to receive appropriate instruction. Early identification of students who are struggling to read is critical to prevent school failure. Children need to be identified early and receive intensive, explicit, and appropriate intervention.

PART FOUR: STRATEGIES TO HELP STRUGGLING READERS

As stated in previously in this article, instruction must be explicit, relevant to the needs and age-levels of the students, and must continue at all grade levels. It should be systematic, direct, sequential, and cumulative.

Some ideas for providing this type of instruction:

- Include music, movement, and art
- Multi-sensory instruction includes touch, movement, hearing, seeing, speaking, smelling, and even taste--let's make letters and words out of food and eat them!
- Engage in blindfold activities to improve listening and visualization
- Provide tactile tracing: e.g. sandpaper letters, finger painting, etc.
- Use air writing: children say and spell words aloud by creating large letters in the air while they look at the words on the chalkboard
- Alphabet word building game: start with a simple two-letter syllable and build words by adding every consonant to the beginning of the syllable: example: ab, eb, ib, ob, ub. Now add each consonant of the alphabet, in order, to the beginning of the syllable to make a word. Some words will be real, some nonsense. Continue the game changing the ending consonants. Thus, all vowels and consonants are used. Move on to blend, digraphs, etc.
- Rhyming games, read Dr. Seuss books for ideas, have students make-up their own rhymes using real and nonsense words
- Letter substitution: e.g. replace the "r" in the word "rat' with "p" and what do you have?
- Use letter substitution for beginning, middle, and ends of words
- Create compound words, real and nonsense, if the words are real, define them
- Always make certain students know and understand the meanings of words in stories they read and that are read to them
- Always discuss obvious and inferred concepts, ideas, and opinions in literature and non-fiction
- Play memory games and teach memory strategies

- Group sentence building: everyone adds a word to see how long a sentence we can make
- Engage in real and nonsense word building
- Role play stories
- Play "Charades"
- Constantly build vocabulary through activity and example
- Build vocabulary by reiterating a sentence/concept using different words that are synonyms for the words you used the first time. My favorite joke: the song *Row*, *Row, Row Your Boat* becomes:
  "Propel, propel, propel your craft,
  along the liquid solution,
  ecstatically, ecstatically, ecstatically, ecstatically,
  existence is but an illusion"
- Use commercially available word games: Scrabble, Perquacky, UpWords, Boggle, Pictionary, etc.
- Put words on 3 x 5 cards, color-coded for parts of speech, and have students manipulate them into sentences
- Have students generate words for their own recipe file box of color-coded 3 x 5 cards
- Have students write and illustrate their own books based on the patterns/themes from favorite picture books series (*A My Name is Alice* and other alphabet books; *Hop on Pop* and other Dr. Seuss books; *Harry the Dirty Dog; Clifford, the Big Red Dog;* etc)
- Research structured learning programs and find what works best for you and your students
- Don't rely on just one program, become eclectic, include everything that works
- Read along to audio books
- Have child dictate a story and then write the story for him/her to read own words
- Clarify or simplify written directions
- Block out extraneous stimuli on assignments
- Highlight essential information
- Develop reading guides
- Reduce amount of information on assignment/work pages
- Simultaneously combine verbal and visual information
- Maintain daily routines
- Encourage use of graphic organizers

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Mrs. Offstein is serving as the current President of the Southern California Tri-Counties Branch of the International Dyslexia Association. Tri-Counties IDA provides information about dyslexia and other language-based learning differences. Our website is: www.dyslexia-ca.org.