



Truth or Fib....

- *Reading is a cultural invention.*
- *Dyslexia is dimensional; a person can be "a little" or severely dyslexic and everything in between.*
- *It can co-exist with other disorders.*

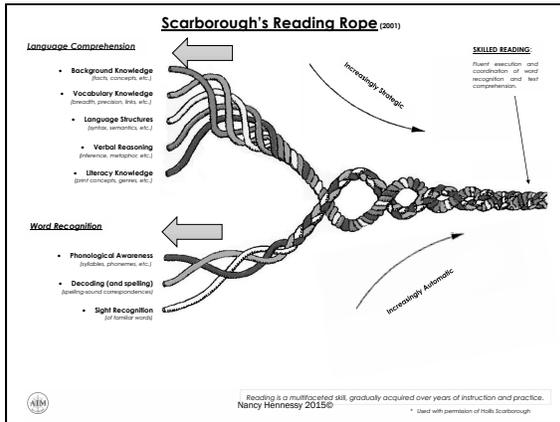
Nancy Hennessy 2015©

Dyslexia

The understanding is scientific!

M.B.Rawson, 1982

Nancy Hennessy 2015©



So, what does the research tell us about causes, characteristics and consequences?

Nancy Hennessy 2015©

Travel back in time...

"It is evident that it is a matter of the highest importance to recognise as early as possible the true nature of this defect, when it is met with in a child. It may prevent much waste of valuable time and may save the child from suffering and cruel treatment... The sooner the true nature of the defect is recognised, the better are the chances of the child's improvement" (p. 10).

Nancy Hennessy 2015©

Samuel T. Orton

Stephosymbolia



Nancy Hennessy 2015©

Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities.

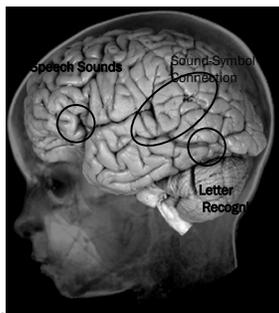
These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.

Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

Adopted by the Board of Directors: November 12, 2002

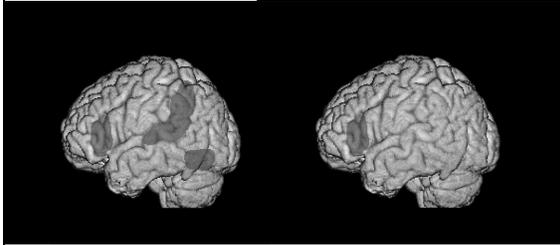
The neural basis of reading

- Left inferior frontal gyrus
- Left temporo-parietal cortex
- Left infero-temporal cortex



Nancy He

Neurobiological Basis of Dyslexia



Typical Readers

Dyslexic Readers

Brain Briefings, Society for Neuroscience

Nancy Hennessy 2015©

Mapping the neural pathways

Lyon, Shaywitz & Shaywitz, 2003

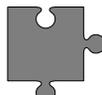
range of neurobiological investigations has documented the disruption of neural systems for reading in dyslexia that cross languages and cultures.

- Imaging studies indicate different activation patterns in proficient vs. poor readers.
- Good readers of all ages show strong activation in the back of the brain, less in the front in the left hemisphere.
- **Dyslexic individual uses auxiliary systems on the right side of the brain and show an under-activation of neural systems in the back.**
- **Dyslexic children also show over activation in frontal area (neural signature for phonologic difficulties).**

Nancy Hennessy 2015©

“Reading-impaired young children have higher levels of the metabolites glutamate and choline in their brains, and these higher levels continue to be indicative of difficulties in developing typical reading and language skills.”

Yale Office of Public Affairs & Communications, 2014



Ken Pugh, Stephen Frost, Douglas Rothman, Fumiko Hoeft, Stephanie Del Tufo, Graeme Mason, Peter Molfese, Einer Mencl, Elena Grigorenko, Nicole Landi, Jonathan Preston, Leslie Jacobsen, and Mark Seidenberg.

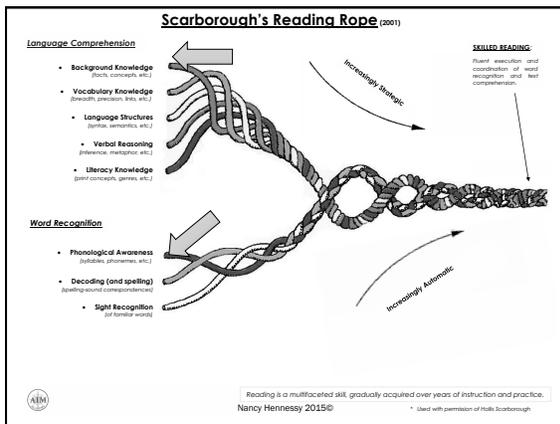
Nancy Hennessy 2015©

Dyslexia is.....

These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.

Secondary consequences.....

Adopted by the Board of Directors: November 12, 2002
Nancy Hennessy 2015©



deficits in phonological processing.....



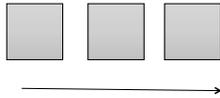
- phonological and phonemic awareness
- phonological memory- working with, storing and retrieving information from memory
- speech perception and production- perceiving and producing phonological sequences.....

neural mechanisms that allow us to use speech sounds to process oral and written language.

Nancy Hennessy 2015©

Accurate & Automatic Phonemes...

- Identify
- Categorize
- Isolate
- Blend
- Segment
- Delete...



One more piece of the puzzle..

Phonological deficit can range in severity across individuals...its' impact on reading outcome can increase or decrease depending on co-occurring risk factors or protective factors.

Pennington, Schriben & Boada, 2009



Nancy Hennessy 2015©

Potential Co-Existing Problems

- Language
- Dysgraphia
- Dyscalculia
- ADHD
- Executive Function....

*PA a major contributor but **dyslexia is the outcome of multiple risk factors** interacting synergistically with the environment e.g. other aspects of language e.g. morphological awareness, RAN, early expressive language (syntax).....*

Torpa et al, 2010

Nancy Hennessy 2015©

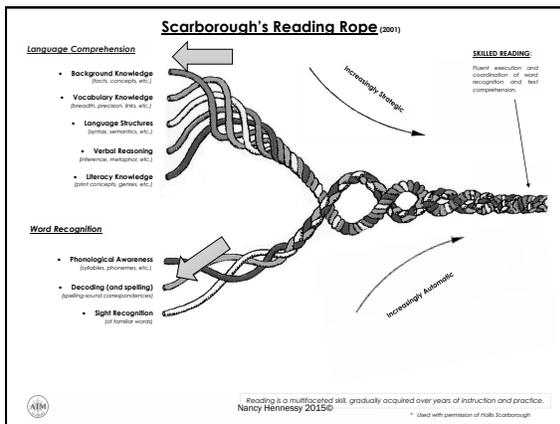
Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities.

These difficulties.....

Secondary consequences.....

Adopted by the Board of Directors: November 12, 2002

Nancy Hennessy 2015©



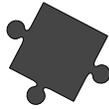
difficulties with accurate and/or fluent word recognition and poor spelling....

“A child has to develop the insight that spoken words can be pulled apart into phonemes and that letters in a word represent these sounds.”

Ben: “Oh, I get it-sounds make words!”

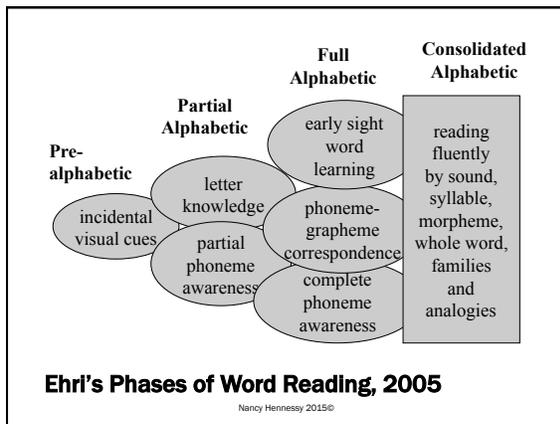
Automatic & Accurate

- Letter naming
- Letter-sound association
- Word reading



Critical Piece of the Reading Proficiency Puzzle

Nancy Hennessy 2015©



Ehri's Phases of Word Reading, 2005

Nancy Hennessy 2015©

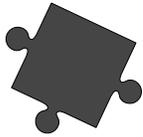
Skilled reading.....

“Most of the words are known by sight. Sight reading is a fast acting process. The term sight indicates sight of the word activates that word in memory including information about its pronunciation, spelling, typical role in sentences and meaning.”

Ehri, 2005

Nancy Hennessy 2015©

“Most people think dyslexia is a reading disorder but it is also a spelling and writing problem.”



Berninger, 2006

Nancy Hennessy 2015©

I saw a red surfboard laying on the rode. It look like my friend so I hid it in the bushis just in case. When I whent to the bech I saw my frend Spence he had his bord....



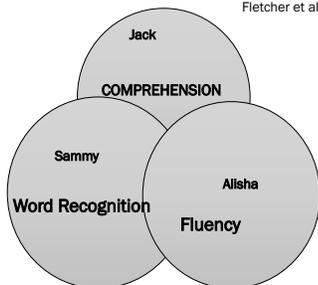
“Too many cooks spoil the broad.”

Nancy Hennessy 2015©

Struggling readers.....

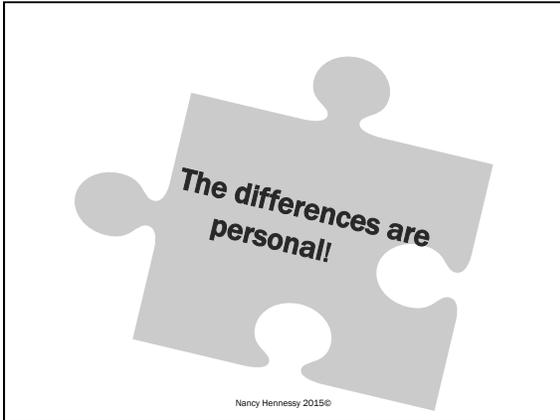


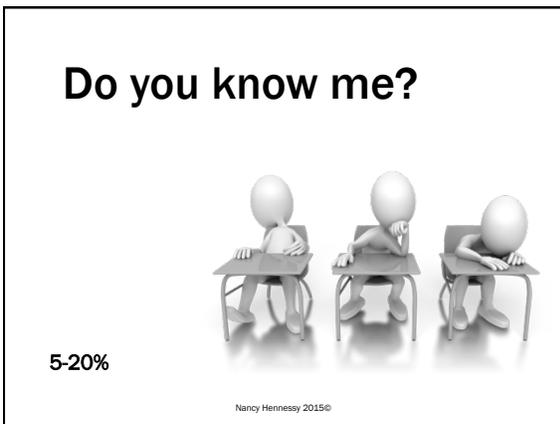
Phonological
Surface
Deep



Fletcher et al, 2007

Nancy Hennessy 2015©





- 5-20%-dependent on definition & criteria
- not all or nothing
- continuum of difficulty

“at least one fifth or 20% of the population predisposed to have significant difficulty with reading and another 20% need some help to get on track and stay on track.”

Moats & Dakin, 2008

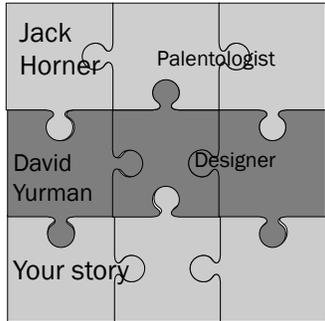
Nancy Hennessy 2015©

Dyslexia is.....

These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.

Secondary consequences.....
Adopted by the Board of Directors: November 12, 2002

Nancy Hennessy 2015©



We think outside the box precisely because we have never been in one.

I was ADD and dyslexic, but wasn't diagnosed with ADD until '75. I would daydream and find my language in drawing and lines. I learned how to weld, and I had these little objects around. I put loops on them and sold them in the cafeteria.

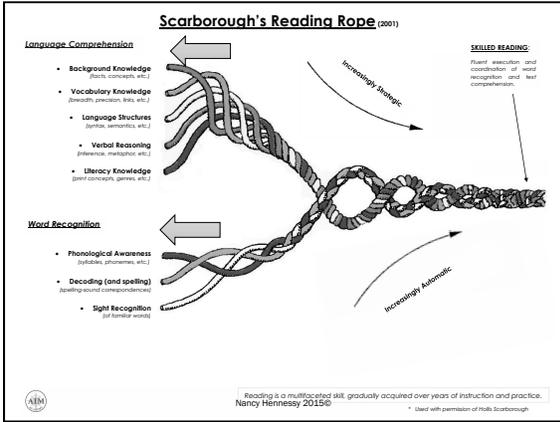
Nancy Hennessy 2015©

Dyslexia is....

These difficulties....

Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

Adopted by the Board of Directors: November 12, 2002
Nancy Hennessy 2015©



“attention to code is capacity draining-results in inability to attend to meaning that results in:

- less exposure to text, less practice that results in.....
- diminished capability in areas of vocabulary, syntactic structures and declarative knowledge
- that influences verbal intelligence.”

Cunningham & Stanovich, 2002

Nancy Hennessy 2015©

The diagnosis is clinical.

M.B. Rawson, 1982

Nancy Hennessy 2015©

Types of assessment

- Screening
- Progress monitoring
- **Diagnostic**
- Outcome

Nancy Hennessy 2015©

Assessment of Dyslexia

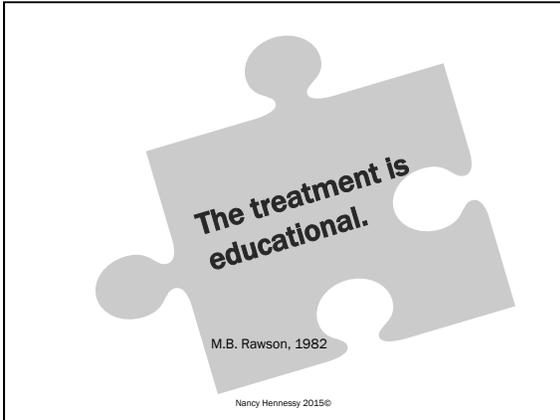
- Thorough analysis and synthesis of assessment data informed by **professional clinical judgment**.
- **No single test is designed to diagnose dyslexia** rather the determination must be based on observational, historical and informal/formal assessment data.

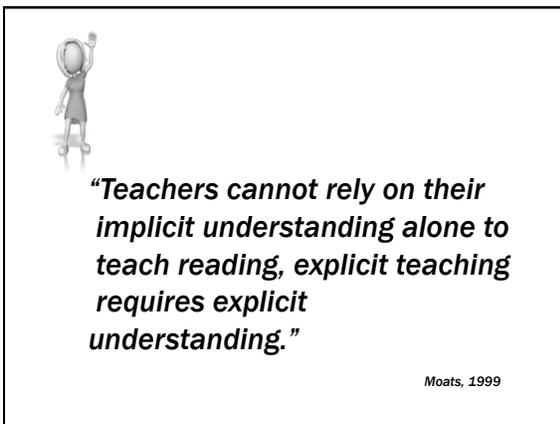
Testing for Dyslexia, 2000
IDA www.interdys.org
Nancy Hennessy 2015©

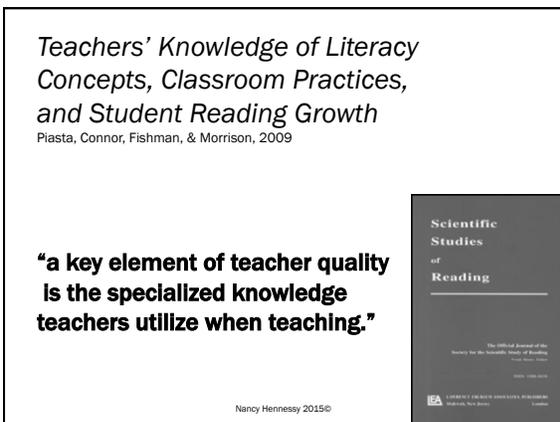
Assessment...

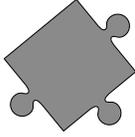
- *Oral Language*
- **Phonological processing (awareness, memory, RAN)**
- **Orthographic Processing**
- **Word recognition (accuracy & automaticity)**
- **Spelling (phonic and orthographic errors)**
- **Decoding (familiar and unfamiliar words)**
- **Comprehension (listening & reading)**

Lowell, Felton & Hook, 2014
Nancy Hennessy 2015©



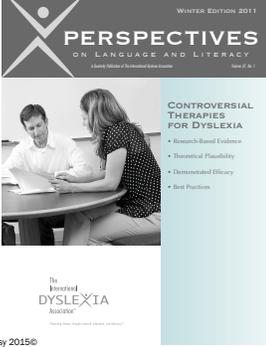






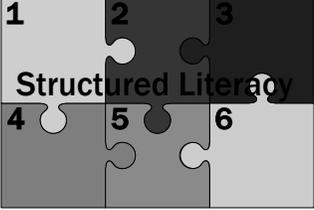
**Vision Efficiency
Movement Based
Therapies**

The Eyes Don't Have It-IDA 2015
Nancy Hennessy 2015©



"Vision problems can interfere with the process of learning; however, vision problems are not the cause of primary dyslexia or learning disabilities. Scientific evidence does not support the efficacy of eye exercises, behavioral vision therapy, or special tinted filters or lenses for improving the long-term educational performance in these complex pediatric neurocognitive conditions. Diagnostic and treatment approaches that lack scientific evidence of efficacy, including eye exercises, behavioral vision therapy, or special tinted filters or lenses, are not endorsed and should not be recommended."

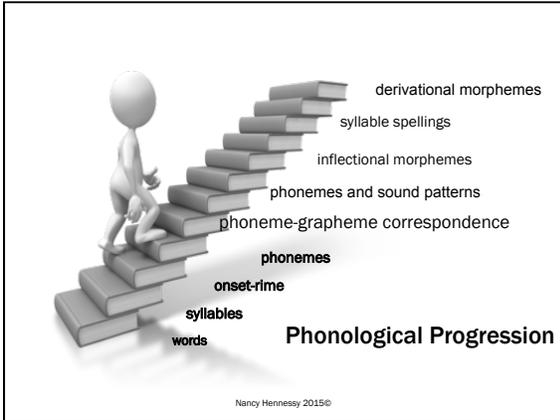
American Academy of Pediatrics, 2008
Nancy Hennessy 2015©



1. Linguistic Concepts **4. Cumulative**
2. Systematic **5. Multisensory**
3. Explicit **6. Intensive**

Applied to purposeful reading and writing

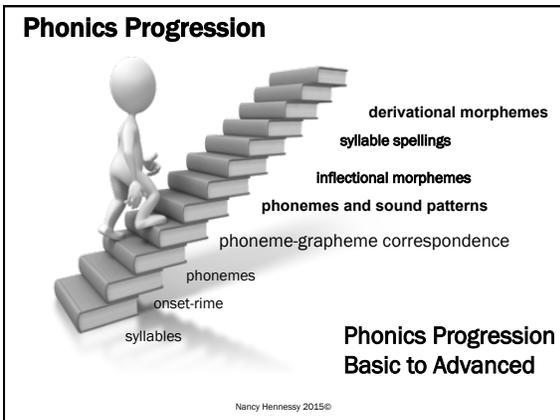
Louisa Moats, 2014



Dyslexia creates a breakdown in the acquisition and application of alphabetic knowledge that results in slow, labored reading development, delayed automaticity, and poor spelling. The treatment requires direct, intensive instruction in the alphabetic system, followed by methods to build rate and fluency.

Mather, 2013

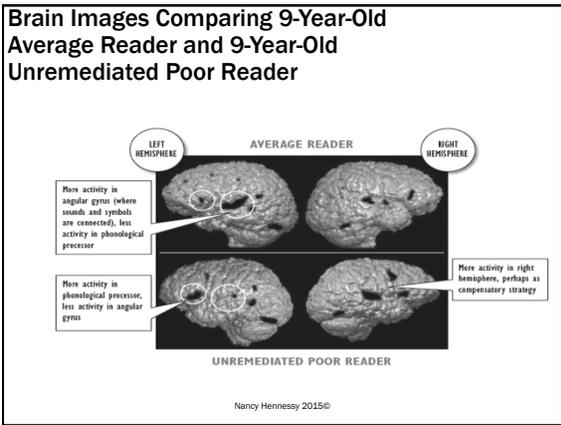
Nancy Hennessy 2015©

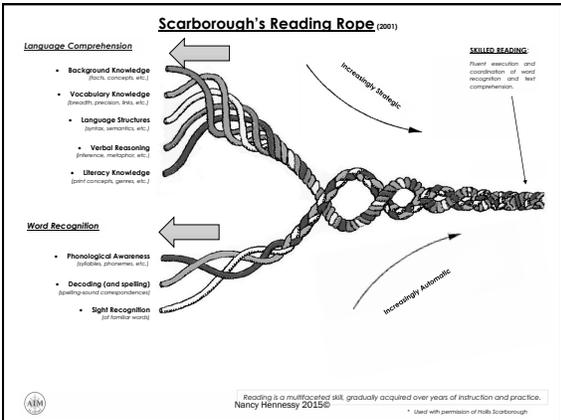


Brain research has demonstrated that reading fluency is strongly associated with the development of the brain's reading system and that this system is amenable to the effects of intervention.

Pugh et.al, 2000

Nancy Hennessy 2015©





Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities.

These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction.

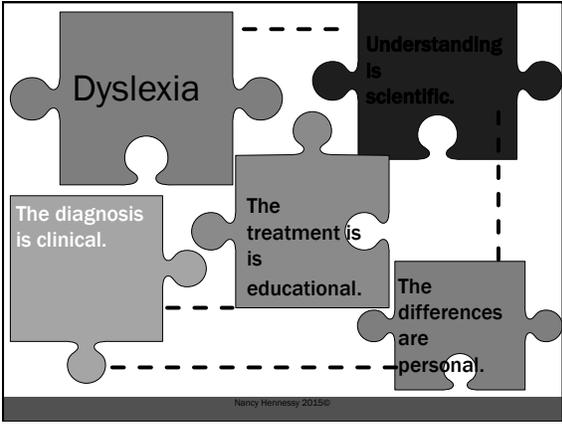
Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.

Adopted by the Board of Directors: November 12, 2002

Expert Teaching is the Answer.

Dakin & Moats, 2014

Nancy Hennessy 2015©



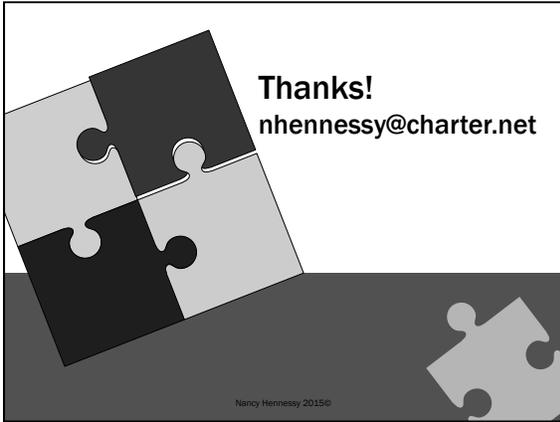


Dyslexia is...

www.interdys.org

Nancy Hennessy 2015©

Nancy Hennessy 2015©



**Time to Demystify
Truth or Fib**

1. *Reading is a cultural invention.*
2. *Dyslexia is dimensional; a person can be “a little” or severely dyslexic and everything in between.*
3. *It can co-exist with other disorders.*
4. *Dyslexic students typically have problems with reading comprehension.*
5. *Vision therapy is an effective approach to treating dyslexia.*
6. *Dyslexia has a neuro-biological base.*
7. *There is an age limit on when remediation is still effective.*
8. *Working with the speech sounds of our language is often difficult for the dyslexic.*
9. *Dyslexia affects only those with above average IQs.*
10. *Approximately, 5-20% of the population exhibits some symptoms of dyslexia, including slow or inaccurate reading, poor spelling or poor writing.*
11. *Reversals are always a symptom of dyslexia.*
12. *More boys than girls are dyslexics.*
13. *Dyslexia is a life long condition and runs in families.*
14. *Dyslexia has only existed for the last fifty years.*
15. *We still have much to learn about the brain and learning.*