

Understanding Dyslexia


Overview

Ros Lugg

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Dyslexia

or

Specific Learning Disability?

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'Word blindness'

Early researchers – 19th Century


- Oswald Berkhan (Germany)
- Pringle Morgan (UK)
- James Hinshelwood (UK)
- Samuel Orton (USA)



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I know. I'll call it dyslexie!

Dr Rudolf Berlin (1887)
Ophthalmologist (Stuttgart)

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Dyslexia

(from Greek)


dys - bad, difficult, problem

lexis - speech, word, reading

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Specific Learning Disability

SLD SpLD

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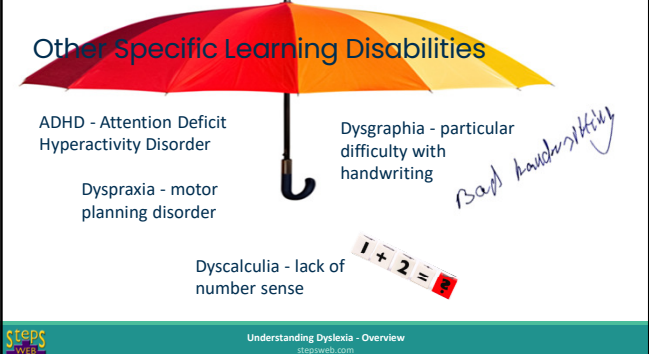
Specific Learning Disability

Not a general learning difficulty

Dyslexia has nothing to do with intelligence!

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Other Specific Learning Disabilities

ADHD - Attention Deficit Hyperactivity Disorder

Dyspraxia - motor planning disorder

Dyscalculia - lack of number sense

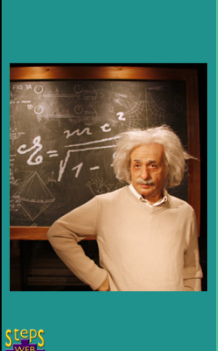
Dysgraphia - particular difficulty with handwriting

Bad handwriting

$1 + 2 = 3$

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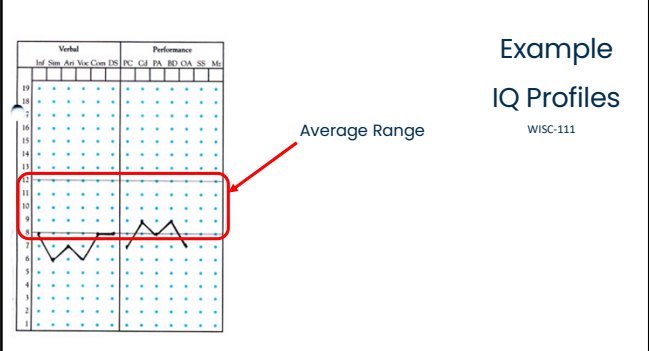
Specific Learning Disability

compared with

low ability

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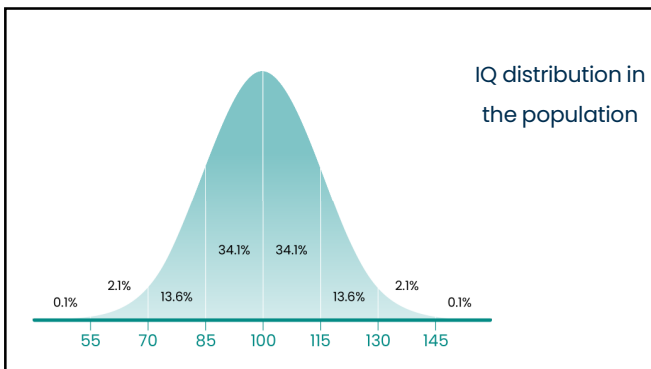


Example IQ Profiles

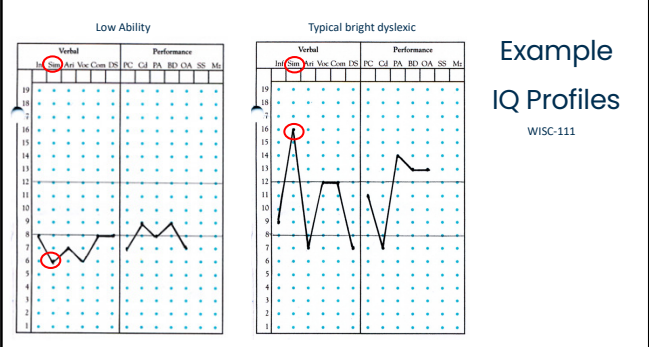
WISC-111

Average Range

10



11



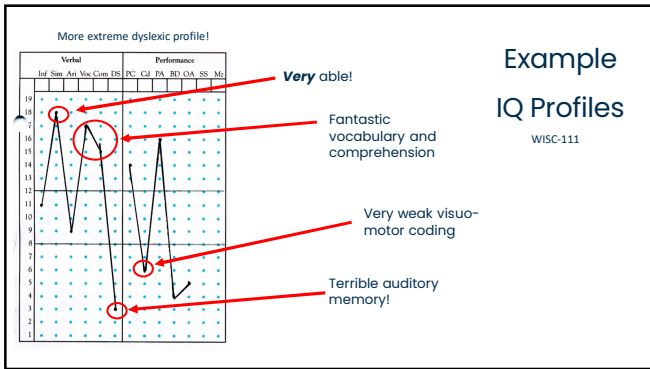
Low Ability

Typical bright dyslexic

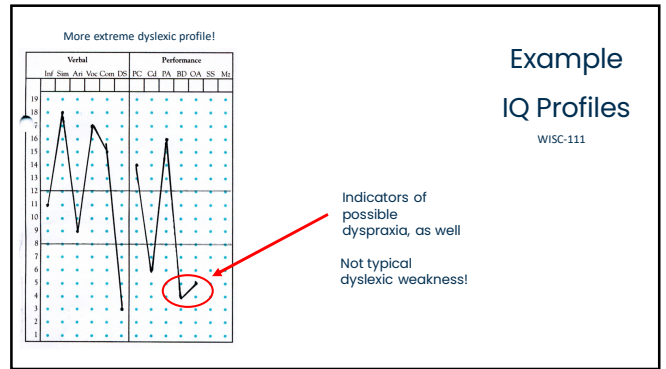
Example IQ Profiles

WISC-111

15



16



17

Differences in brain activation

Electrical patterns of activity are different

Dyslexics use different parts of their brain

Process information differently

Some weaknesses
- but also some strengths!

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Brain structure differences

Planum temporale cortical language area

Corpus callosum

Lateral geniculate nucleus – magnocellular component of the visual system

Occipito-temporal - Visual Word Form Area

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Left hemisphere brain activation for reading

Broca's Area
(articulation and decoding)

Parieto-temporal Area
(decoding)

Visual Word Form Area
(Orthographic Mapping)

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Common dyslexic pattern of activation

Broca's Area
(articulation and decoding)

Thought to be activated at around 150ms

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Compensatory Systems

right
left

Nonimpaired

right
left

Dyslexic

Sally Shaywitz, Overcoming Dyslexia 2003

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Conclusion

Dyslexic learners have:

- An impaired occipito-temporal (Visual Word Form Area)

They therefore over-rely on the wrong areas for reading fluency:

- Broca's area
- Right hemisphere areas

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Consequences for reading fluency

- Decoding areas (over)develop
- Wrong reading strategies being employed
- Wrong areas of the brain being developed

Genuine reading fluency never develops!

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Genetic links

- Chromosome 6 (DCDC2) linked with dyslexia
- Chromosome 15 (KIAA0319) also linked

Dyslexia runs in families!

Boys more likely to be dyslexic?

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Rose (2009)

Dyslexia is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling. Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory and verbal processing speed.

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Rose (2009)

Dyslexia occurs across the range of intellectual abilities. It is best thought of as a continuum, not a distinct category, and there are no clear cut-off points.

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Rose (2009)

Co-occurring difficulties may be seen in aspects of language, motor coordination, mental calculation, concentration and personal organisation, but these are not, by themselves, markers of dyslexia.

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Rose (2009)

The BDA acknowledges the visual and auditory processing difficulties that some individuals with dyslexia can experience, and points out that dyslexic readers can show a combination of abilities and difficulties that affect the learning process.

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IDA (2002)

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

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IDA (2002)

These difficulties typically result from a deficit in the phonological component of language that is unexpected in relation to other cognitive abilities.....

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So where does this leave us?




- Lots of disagreement in definitions
- Consensus about the relevance of phonological awareness
- Consensus that dyslexia is nothing to do with intelligence
- Consensus that dyslexia is a neurological condition

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So where does this leave us?



Lack of consensus about other aspects traditionally associated with dyslexia

- Visual perception
- Motor difficulties
- Sequencing
- Working memory
- b/d confusion
- Left/right confusion

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What does this mean for us?

Many psychologists and assessors are reluctant to apply a label at all.

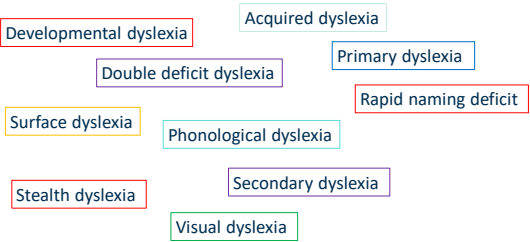
Over-emphasis on the importance of a label.



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Types of dyslexia




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Interesting quote

"The evidence is consistent with an increasingly sophisticated account of dyslexia that does not single out either phonological or visual or motor deficits. Rather, temporal processing in all three systems seems to be impaired. Dyslexics may be unable to process fast incoming sensory information adequately in any domain."


Stein, J., 1997



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Visual Perceptual Skills



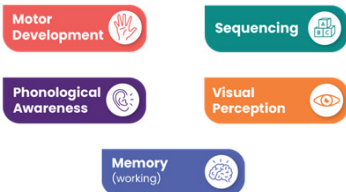
- Visual discrimination
- Visual memory
- Visual-spatial relationships
- Visual sequential memory
- Visual closure
- Visual figure-ground

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Processing and perceptual skills


The Big Five



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Memory




- Visual memory
- Visual sequential memory
- Auditory sequential memory
- Working memory
- Long-term memory and retrieval

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Long-term Memory Implications



Difficulty with retaining and retrieving factual information means dyslexics need:

- More help to develop study skills
- To be taught mind-mapping and planning skills

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Memory Implications

A non-dyslexic child takes between 4 and 10 exposures to a word to fix it in long-term memory.

A dyslexic learner may need 500 – 1300 exposures to the same word!

Bateman, B., 1991

Repetition and reinforcement

Lots and lots!

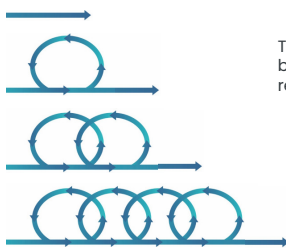


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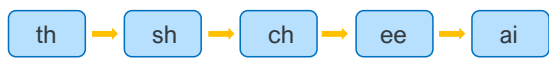
The Circular Progression

The importance of constantly going back, re-checking and, if necessary, re-teaching



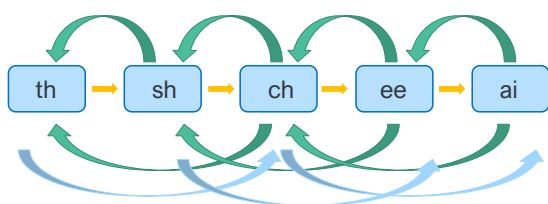
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Personal Observations!



Dyslexic learners often don't automatically understand memory strategies.

- We need to specifically teach memory strategies.
- We need to incorporate memory activities into our modern curriculum.


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Memory Strategies

- Repetition
- Chunking
- Associating words with letters

Inner voice!




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Memory Strategies

Ability to retain visual image




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Possible indicators

- Obvious 'good' or 'bad' days with no reason
- Confusion between directional words
- Difficulties with sequences – days, months, tables
- Family history
- Discrepancy between oral and written language
- Reversals/mis-sequencing letters




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Possible indicators

- Poor concentration
- Forgets or misunderstands instructions
- Reading comprehension
- Takes longer to do written work
- Slow processor
- Problems copying, particularly from the board




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Possible indicators

- Problems planning essays
- Poor confidence or self-esteem
- Might appear awkward or clumsy
- Very inconsistent abilities
- Unexpected difficulties with certain tasks
- Sometimes tongue-tied – anxious about answering questions in class

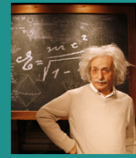


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Possible strengths

- Innovative thinkers
- Excellent trouble shooters
- Intuitive problem solvers
- Creative – arts, architecture, design, engineering
- Lateral thinkers
- Often excellent with computers
- Often great at 'higher level' maths!



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Famous dyslexics

Alexander Graham Bell	Nelson Rockefeller	George Washington
Winston Churchill	Henry Ford	W B Yeats
John Britten	Walt Disney	Terry Goodkind
Thomas Edison	Cher	Andy Warhol
George Paton	John Lennon	
Orlando Bloom	Auguste Rodin	
Picasso	Whoopi Goldberg	
Jackie Stewart	Mohammed Ali	
Leonardo da Vinci	Winston Churchill	
Tom Cruise	Agatha Christie	

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Common language problems

Interpretation – can be quite literal. Don't understand 'figures of speech'

Language of maths
70% of dyslexics experience difficulty with number language words (sum, total, odd, take away)
Chasty, 1975

Comprehension – reading and listening


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Dyslexia and behaviour

Internationally 60-80% of prison populations are dyslexic

Dyslexia causes huge anxiety and self-esteem problems – particularly with brighter pupils.



 

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School Support

- In-class support versus withdrawal
- Identification and access to assessments
- Assistive technology
- Flexibility and understanding



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Homework issues

- Tiredness – sheer overload
- Slow processors – takes extra time
- Often inappropriate to needs

Read to them – write for them!


 

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Exam Conditions


- Extra time
- Reader-writer
- Use computer

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Assistive technology

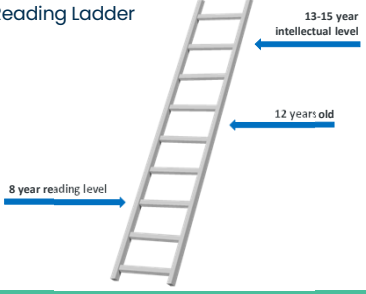
- Laptop/computer in class and for exams
- Voice-activated software – speech recognition
- Reading pens/scanner technology
- Hand-held digital voice recorder
- Audio books



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The Reading Ladder



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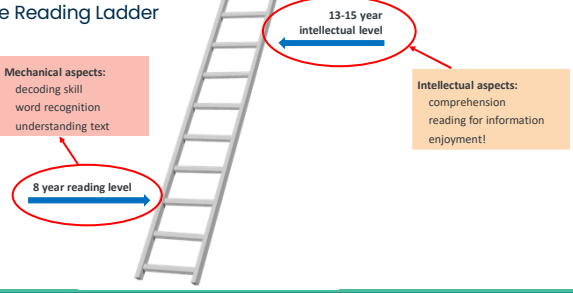
The Reading Ladder



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The Reading Ladder



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How we can help most

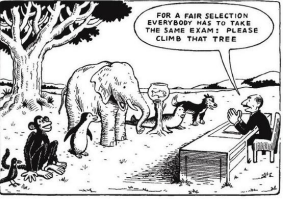
- By understanding that some learners learn differently
- By not judging from their written work – value ideas, not just written words!
- By seeing individual needs and catering for them – ‘Notice and adjust!’
(Neil McKay)
- By building an awareness of what dyslexia is – at home, in class, in the workplace

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How we can help most

By understanding that fairness is not expecting the same from everyone



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