

Understanding Dyslexia

Overview

Ros Lugg

STEPS
WEB

Understanding Dyslexia - Overview
stepsweb.com

1



Dyslexia

or

Specific Learning Disability?


Understanding Dyslexia - Overview
stepsweb.com

2

'Word blindness'

Early researchers – 19th Century


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



STEPS
WEB

Understanding Dyslexia - Overview
stepsweb.com

3




I know. I'll call it dyslexie!

Dr Rudolf Berlin (1887)
Ophthalmologist (Stuttgart)

Understanding Dyslexia - Overview
stepsweb.com

4




Dyslexia (from Greek)

dys - *bad, difficult, problem*

lexis - *speech, word, reading*

Understanding Dyslexia - Overview
stepsweb.com

5



Specific Learning Disability

SLD SpLD

Understanding Dyslexia - Overview
stepsweb.com

6



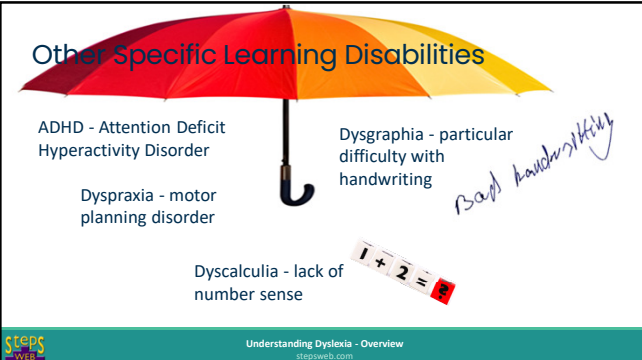
Specific Learning Disability

Not a general learning difficulty

Dyslexia has nothing to do with intelligence!

Understanding Dyslexia - Overview
stepsweb.com

7



Other Specific Learning Disabilities

ADHD - Attention Deficit Hyperactivity Disorder

Dyspraxia - motor planning disorder

Dyscalculia - lack of number sense

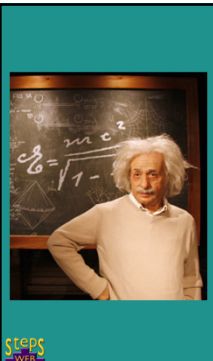
Dysgraphia - particular difficulty with handwriting

Bad handwriting

1 + 2 = 3

Understanding Dyslexia - Overview
stepsweb.com

8



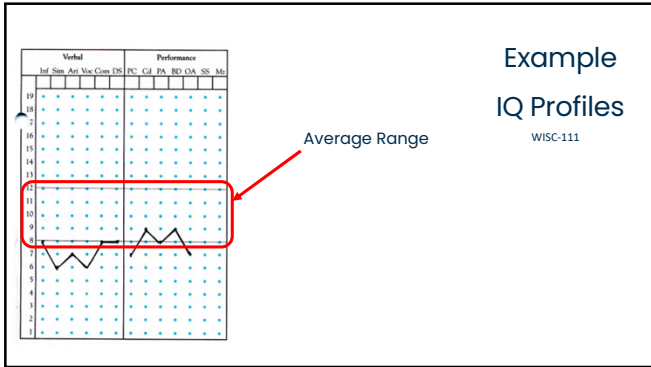
Specific Learning Disability

compared with

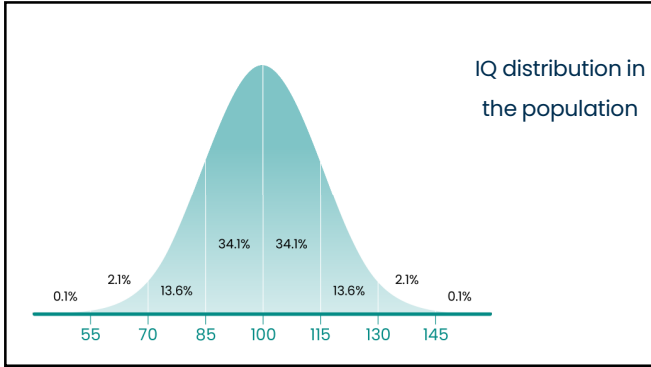
low ability

Understanding Dyslexia - Overview
stepsweb.com

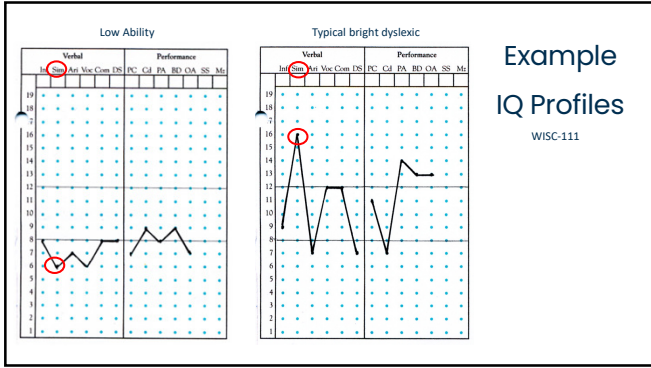
9



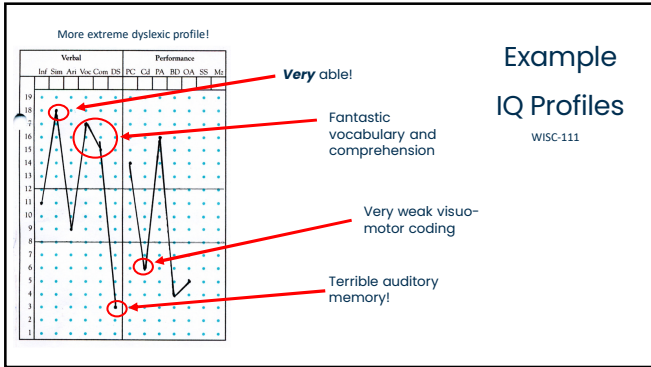
10



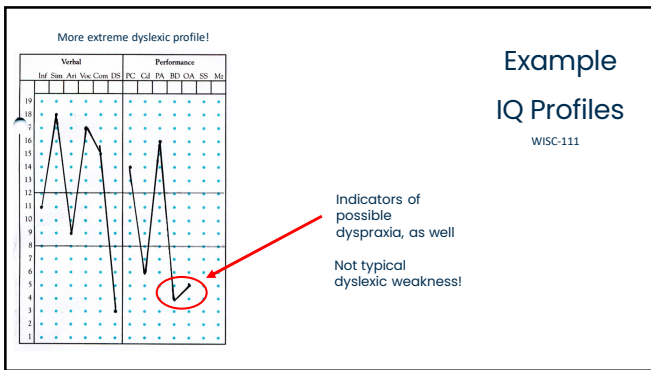
11



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!

Understanding Dyslexia - Overview
www.stepsweb.com

20

Brain structure differences

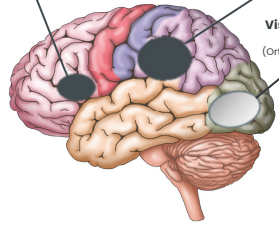


- Planum temporale cortical language area
- Corpus callosum
- Lateral geniculate nucleus – magnocellular component of the visual system
- Occipito-temporal - Visual Word Form Area**

Understanding Dyslexia - Overview
stepsweb.com

22

Left hemisphere brain activation for reading

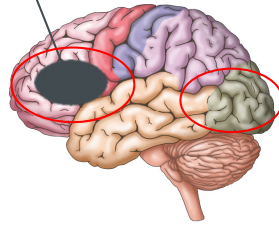


- Broca's Area** (articulation and decoding)
- Parieto-temporal** (decoding)
- Visual Word Form Area** (Orthographic Mapping)

Understanding Dyslexia - Overview
stepsweb.com

24

Common dyslexic pattern of activation



- Broca's Area** (articulation and decoding)
- Thought to be activated at around 150ms

Understanding Dyslexia - Overview
stepsweb.com

25

Compensatory Systems

right
left
Nonimpaired

right
left
Dyslexic

Sally Shaywitz, Overcoming Dyslexia 2003

stepsweb.com
Understanding Dyslexia - Overview
stepsweb.com

26

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

stepsweb.com
Understanding Dyslexia - Overview
stepsweb.com

27


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!

stepsweb.com
Understanding Dyslexia - Overview
stepsweb.com

28



Genetic links


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

Dyslexia runs in families!

Boys more likely to be dyslexic?

Understanding Dyslexia - Overview
 stepsweb.com

29




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.

Understanding Dyslexia - Overview
 stepsweb.com

30




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.

Understanding Dyslexia - Overview
 stepsweb.com


31


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.

 Understanding Dyslexia - Overview
www.stepsweb.com


32


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.

 Understanding Dyslexia - Overview
www.stepsweb.com


33


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.

 Understanding Dyslexia - Overview
www.stepsweb.com

34



International
DYSLEXIA
Association

IDA (2002)

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

Understanding Dyslexia - Overview
stepsweb.com

35

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

Understanding Dyslexia - Overview
stepsweb.com

36

So where does this leave us?



Lack of consensus about other aspects traditionally associated with dyslexia

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

Understanding Dyslexia - Overview
stepsweb.com

37

What does this mean for us?

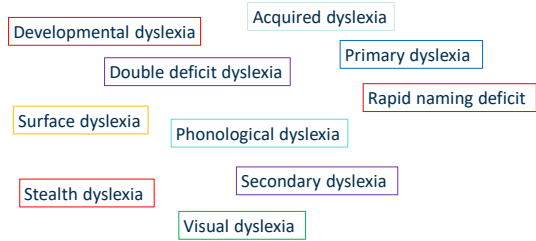
Many psychologists and assessors are reluctant to apply a label at all.

Over-emphasis on the importance of a label.



38

Types of dyslexia



39

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



40

Visual Perceptual Skills



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

Understanding Dyslexia - Overview
stepsweb.com

43

Processing and perceptual skills

The Big Five


- Motor Development
- Sequencing
- Phonological Awareness
- Visual Perception
- Memory (working)

Literacy Development – Key Stages
stepsweb.com

44

Memory

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



Understanding Dyslexia - Overview
stepsweb.com

46

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

Understanding Dyslexia - Overview
stepsweb.com

47

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!

Understanding Dyslexia - Overview
stepsweb.com

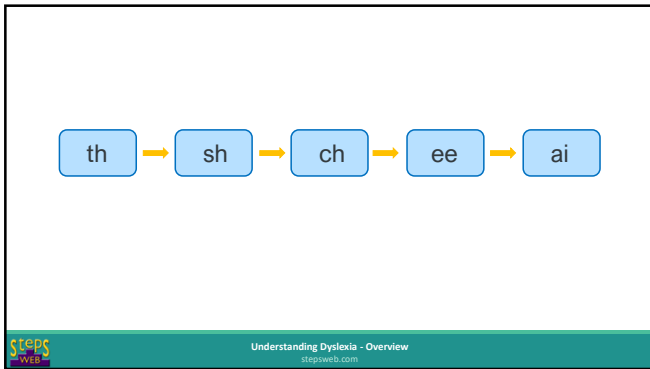
48

The Circular Progression

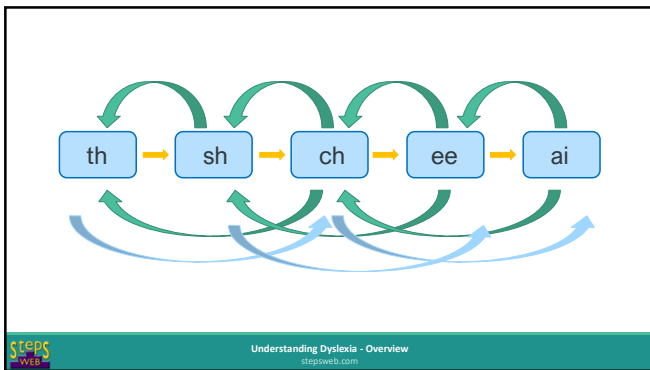
The importance of constantly going back, re-checking and, if necessary, re-teaching

Understanding Dyslexia - Overview
stepsweb.com

49



50



53


<p>Personal Observations!</p> 	<p>Dyslexic learners often don't automatically understand memory strategies.</p> <p>We need to specifically teach memory strategies.</p> <p>We need to incorporate memory activities into our modern curriculum.</p> <p style="font-size: small; text-align: center;">Understanding Dyslexia - Overview stepsweb.com</p>
-------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

54

Memory Strategies

- Repetition
- Chunking
- Associating words with letters

Inner voice!




Understanding Dyslexia - Overview
stepsweb.com

59

Memory Strategies

Ability to retain visual image




Understanding Dyslexia - Overview
stepsweb.com

61

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




Understanding Dyslexia - Overview
stepsweb.com

62

Possible indicators

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




Understanding Dyslexia - Overview
stepsweb.com

63

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

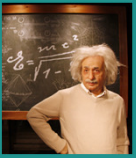


Understanding Dyslexia - Overview
stepsweb.com

64

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!



Understanding Dyslexia - Overview
stepsweb.com

65


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	

Understanding Dyslexia - Overview
stepsweb.com

66

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

Understanding Dyslexia - Overview
stepsweb.com

67

Dyslexia and behaviour




Internationally 60-80% of prison populations are dyslexic

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

Understanding Dyslexia - Overview
stepsweb.com

68

School Support




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

Understanding Dyslexia - Overview
stepsweb.com

69

Homework issues



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

Read to them – write for them!

Understanding Dyslexia - Overview
stepsweb.com

70


Exam Conditions

Extra time
 Reader-writer
 Use computer

Understanding Dyslexia - Overview
stepsweb.com

71

Assistive technology

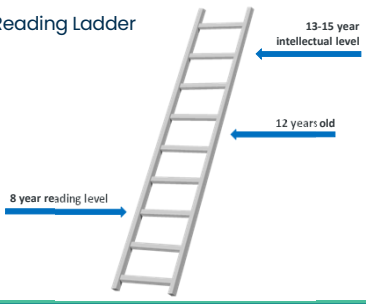


- Laptop/computer in class and for exams
- Voice-activated software – speech recognition
- Reading pens/scanner technology
- Hand-held digital voice recorder
- Audio books

Understanding Dyslexia - Overview
stepsweb.com

72

The Reading Ladder



8 year reading level

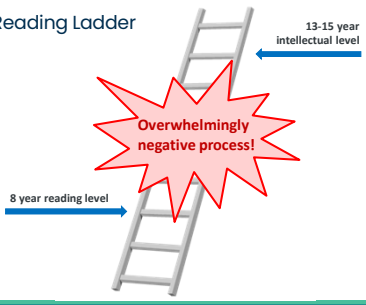
13-15 year intellectual level

12 years old

Understanding Dyslexia - Overview
stepsweb.com

73

The Reading Ladder



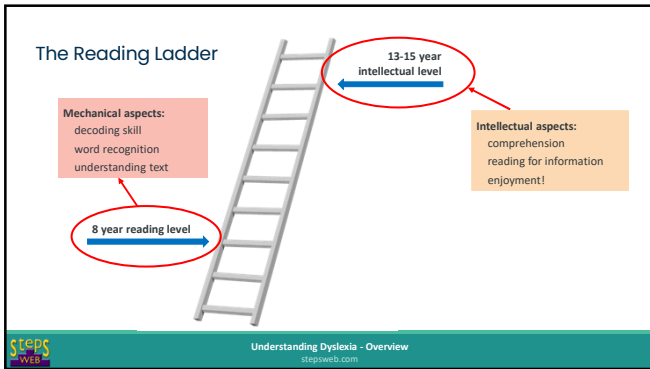
8 year reading level

13-15 year intellectual level

Overwhelmingly negative process!

Understanding Dyslexia - Overview
stepsweb.com

74



75

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

steps WEB
Understanding Dyslexia - Overview
stepswb.com

76

How we can help most

By understanding that fairness is not expecting the same from everyone

FOR A FAIR SELECTION EVERYBODY HAS TO TAKE THE SAME EXAM: PLEASE CLIMB THAT TREE

steps WEB
Understanding Dyslexia - Overview
stepswb.com

77
