



Learning Difficulties

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What do you know about
learning disorders and
problems?





What is learning?

“The activity or process of gaining knowledge or skills by studying, practicing, being taught, or experiencing something and make the knowledge your own.”



Learning disorders
vs
Learning problems

Learning Disorders


Disorders in:

- o Basic psychological processes
- o Understanding + using language
- o Receive
- o Recall
- o Process
- o Communicate

Learning problems

- o Reading problem (Dyslexia)
- o Writing problem (Dysgraphia)
- o Spelling problem
- o Mathproblem (Dyscalculia)






Primary
vs
Secondary
Learning Problems

Primary learning problems

- o Problems that manifest on learning the academic skills itself.
- o There is no delaying in development of the child.

Secondary learning problems

- o Problems or disorders which have effect on learning
- o The learning problem exists because of other disorders or problems



What are not learning disorders or problems?

What are not learning disorders or problems?

- o Less intelligence
- o Vision + Hearing impairments
- o Autism spectrum
- o Intellectual disabilities
- o Emotional Disturbance
- o Disadvantages
(Culture/Environmental/Economic)



Prevalence

Prevalence

- o 5%- 20% school-aged children suffer from learning disorders (DSM-5)
 - o 1 out of 5 → *Dyslexia*
 - o 1 out of 50 → *Dyscalculia*
- o Different degrees → continuum
- o No gender differences

Diagnosis

- o Primary or Secondary
- o Non-Verbal Disorder or Verbal Disorder
- o Criteria

Verbal vs Non-Verbal


- o Verbal Disorder
Dyslexia
- o Non-Verbal Disorder
Dyscalculia

Diagnosis Criteria

- Specificity criterion
- Discrepancy criterion
- Exclusivity criterion

Hypotheses

- o 'Magnocellular deficit' hypothesis
- o 'Cerebellar deficit' hypothesis
- o 'Phonological deficit' hypothesis



Dyslexia and Dyscalculia

Dyslexia

Verbal disorder

“Dyslexia is an inherited condition that makes it extremely difficult to read, write, and spell in your native language—despite at least average intelligence.”

Dyslexia

- o Learning disorder in reading and spelling
- o Deficit in phonological skills, independent of general intelligence
- o Specific difficulties in processing of speech sounds → *phonological skills training*

Causes of Dyslexia

- o Genes
- o Neuro(psycho)logical approach

Genes

- o 40-70%
- o DCDC2, *chromosome 6*
- o Heritable

Neurological Approach


- o Larger right hemisphere
- o Don't use the same brain part when reading
- o Neurons on unusual places

<https://www.youtube.com/watch?v=zafiGBrFkR>

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Example

o <https://www.youtube.com/watch?v=Q27DkM4V9rA>



Dyscalculia

Non-verbal

Dyscalculia

- Impairments in learning and remembering arithmetic facts
- Difficulties in visual-spatial and tactile processes.
- Prefer information auditorial
- Difficulties in executing calculation procedures

Types of Dyscalculia

o Development Dyscalculia (DD)

→ General Dyscalculia (GD)

→ Arithmetic Fact Dyscalculia

(AFD)

Biological causes

- o Cortical activity → several brain areas
- o IPS (intraparietal sulcus) → non-symbolic processing
- o IPS, Angular Gyros, Inferior Frontal Gyros → symbolic processing, *but also attention*

Real cause = still unsolved

Example

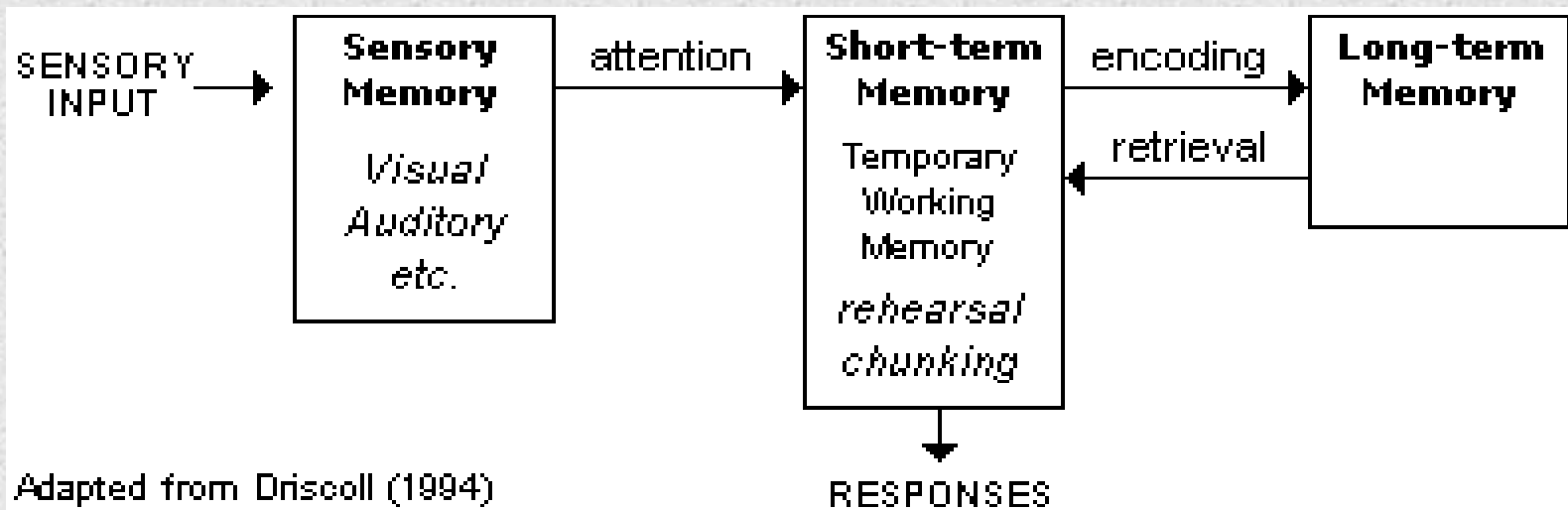
<https://www.understood.org/en/tools/through-your-childs-eyes/player?simq=d7e339d7-7c55-4fd0-bef6-94b1a640d9dc&gradeId=46a45e80-d62e-45ae-90c5-98db914b8aa2&standalone=true>

Link between dyscalculia and dyslexia

- o 40%-50% of dyslexic people have no signs of dyscalculia
- o Difficulties in math test → written questions.

Working Memory


- o Important role
- o Phonological short-term memory
- o The digit span test



Adapted from Driscoll (1994)
Figure 3-1 (p. 69)

Misunderstandings

- o Often wrong (behavioral) diagnosis
- o Lack of motivation
- o Lazy kids



How can you help a child with learning problems?

How can you help a child with learning problems?

- o Don't force them
- o Give them different kinds of tests on schools
- o Be patient
- o Early discovery helps the child
- o Problems in whole class teaching

Adulthood

- o Disorder already exist in childhood
- o Problems in jobs
- o Disorder in later life

Example:

Adult with mild dyslexia

- o Difficulties with learning a foreign language
- o Can't improve their intelligence on paper
- o Terrible spellers
- o Slow readers
- o Troubles with distinguish left and right

Comorbid disorders

- o ADHD and ADD → 50% have learning disorder too.
- o Developmental Coordination Disorder (DCD)
 - Cerebellum



Conclusion:

We don't know enough about this disorders yet

The umbrella could be bigger than we thinking now

Hard to find the causes of these particular kind of disorders



Thank you for listening!

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Questions?