Neuropsychology of Learning Disorders - Exploring the Terrain

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• THE LOBES of the BRAIN
Definition

- An impairment in one’s ability to acquire certain scholastic abilities despite possessing average or above average intellectual ability.
The Goal:
To achieve a general understanding of the phenomena of Learning Disorders/ Disability!!!
Etiology of Learning Disorders

Five Etiology Models

1. The Difference Model
Etiology of Learning Disability

Five Etiology Models cont’d

2. The Deficit Model

3. The Delay Model
Etiology of Learning Disability

Five Etiology Models cont’d

4. The Disruption Model

5. The Personal-Historical Model
Why is LD considered as being the ‘hidden disability’

• ‘Hidden Disability’
WHAT IS NEUROPSYCHOLOGY?

A specialization in clinical psychology that studies the relationship between the brain and behaviour.
Causes/ Etiology of Learning Disabilities

- One leading theory is associated with brain dysfunction. Other theories have been linked to genetic, environmental and biochemical factors.

1. Brain Dysfunction
Causes/ Etiology of Learning Disabilities

Brain Dysfunction (cont’d)

- Prenatal Factors
- Perinatal Factors
- Postnatal Factors
Causes/Etiology of Learning Disabilities

2. Genetic Factors

3. Environmental Influences
Causes/ Etiology of Learning Disabilities

4. Biochemical Factors
Learning Disorders Identified by the DSM IV

• Language

• Calculation

• Problems with Motor Skills

• Communication Disorders
Learning is age dependent and therefore learning disorders are age dependent too.

- By basic school most children are playing around with making sounds vocally.
- By kindergarten, kids should be picking up on common signs, such as exit signs and men’s/women’s room signs.
In older children symptoms are difficulty with one or more of the following:

- reading, spelling, writing or completing math problems
• Dyslexia is an impairment in the brain's ability to translate written images received from the eyes into meaningful language.
• BRAIN SYSTEMS for READING
Dyslexia

- Developmental

- Acquired
Dyslexia – Davis’ Triggers for Disorientation

• Formless Words
Dyslexia / Hyperlexia

HYPERLEXIA –

• A precocious ability to recognize written words
Dyscalculia

- The word "dyscalculia" means difficulty performing math calculations. It is a learning disability which affects math.
Dyscalculia

Common Symptoms associated with Dyscalculia/MD Subtypes

• Semantic memory

• Procedural

• Visual-spatial
Neuroanatomy of Mathematics

- **Parietal Lobe** plays a major role!
Types of Dyscalculia:

Kosc (1974) identified 6 types of dyscalculia:

1. **Verbal dyscalculia**

2. **Practognostic dyscalculia**

3. **Lexical dyscalculia.**
Types of Dyscalculia:

3. Graphical dyscalculia

4. Ideognostic dyscalculia

5. Operational dyscalculia
Dysgraphia & Agraphia

• "Dysgraphia" - difficulty in expressing thoughts in writing and graphing.

• “Agraphia” - pathological loss of ability to write
Motor Skills Disorder

- Commonly associated with other learning disorders
- Developmental Coordination Disorder
Communication Disorders

• Communication difficulties involving verbal language including sign language

• Expressive Language Disorder
Communication Disorders

Mixed Receptive-Expressive Language Disorder

• (Detectable before age 4. May occur in up to 3% of school-age children. Two types: Developmental in which speech may begin late and Acquired due to encephalitis or head trauma).
The Brain and Learning Disorders

• Learning Disorders are related to deficits in various parts of the brain.
NONVERBAL LEARNING DISORDER (NVLD)

FOUR MAJOR DEFICITS:

• Motoric
• Visual
• Social
• Sensory
Skills Affected by Learning Disorders

- Oral Language
- Reading
- Written Language
- Mathematics
- Gross and Fine motor skills
Signals of Learning Disorders

Symptoms in school-age children

• Difficulty understanding and following instructions

• Problems identifying words or a tendency to reverse letters, numbers or words (e.g., confusing "b" with "d," 18 with 81, or "on" with "no.")

• Lacking motor coordination when walking, playing sports, holding a pencil or trying to tie a shoelace

• Frequently loses or misplaces homework, schoolbooks or other items
Concluding...

Neurodiversity in the Classroom!!!!!!

Intervention = Early Neuropsychological Assessment & Diagnosis & Early Targeted Remediation
Learning Disorders & Neuropsychology

Thank You Very Much

&

Thank You Kindly…