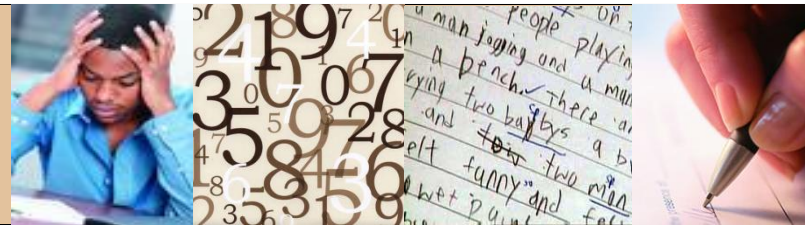




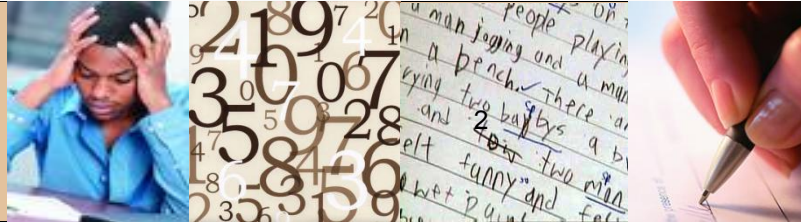
# Neuropsychology of Learning Disorders- Exploring the Terrain

Dr Dennis J. Edwards





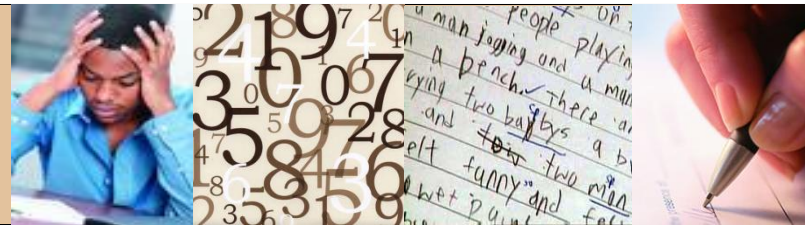
# THE LOBES of the BRAIN





# Definition

- An impairment in one's ability to acquire certain scholastic abilities despite possessing average or above average intellectual ability

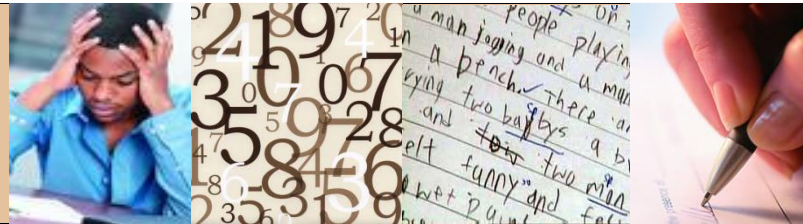




# Identifying & Responding to Learning Disorders

## The Goal:

To achieve a general understanding of the phenomena of Learning Disorders/ Disability!!!

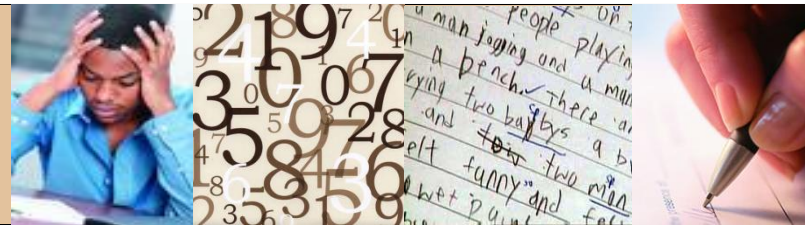




# Etiology of Learning Disorders

## Five Etiology Models

### 1. The Difference Model



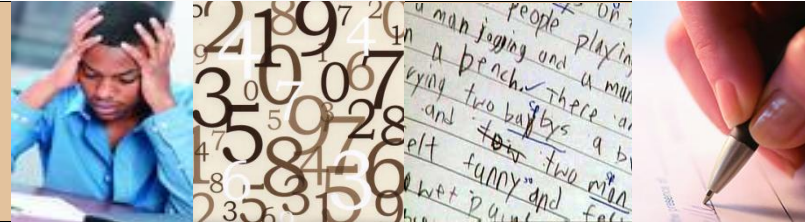


# Etiology of Learning Disability

## Five Etiology Models cont'd

### 2. The Deficit Model

### 3. The Delay Model



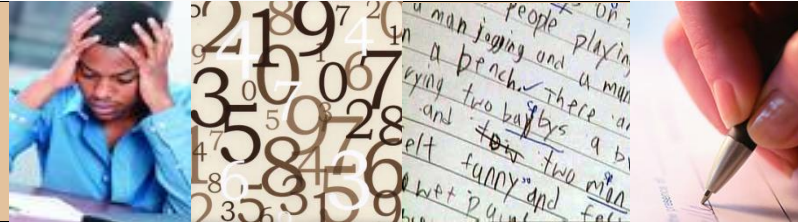


# Etiology of Learning Disability

Five Etiology Models cont'd

**4. The Disruption Model**

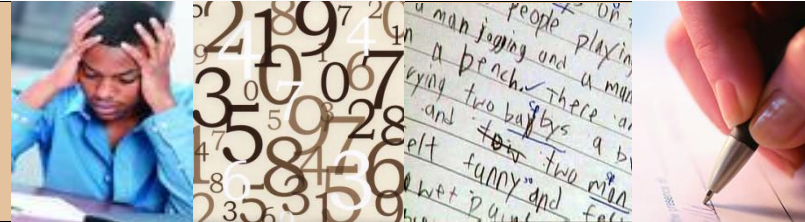
**5. The Personal-Historical Model**





# Why is LD considered as being the 'hidden disability'

- 'Hidden Disability'

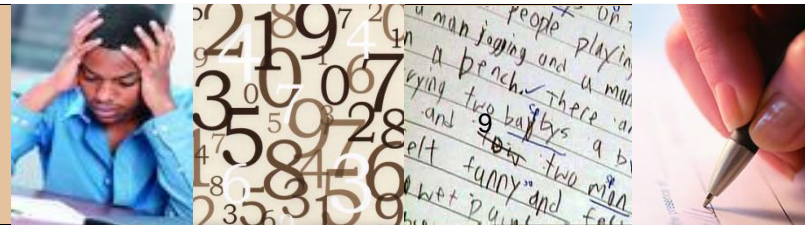






# WHAT IS NEUROPSYCHOLOGY?

A specialization in clinical psychology that studies the relationship between the brain and behaviour

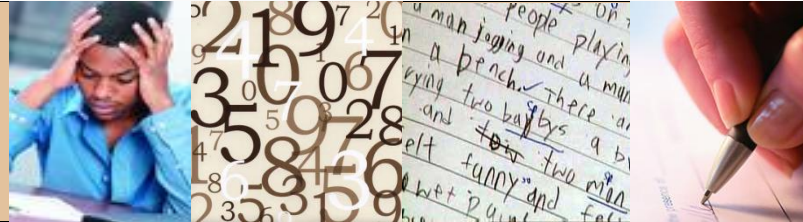




# Causes/ Etiology of Learning Disabilities

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

## 1. Brain Dysfunction

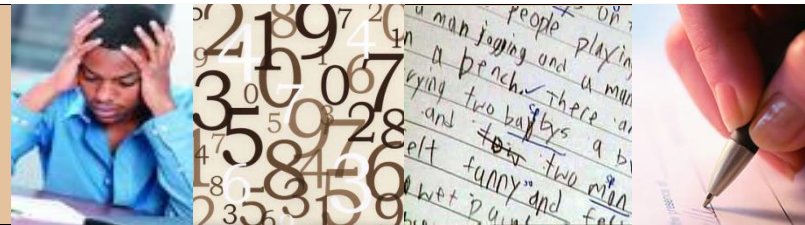




# Causes/ Etiology of Learning Disabilities

## Brain Dysfunction (cont'd)

- Prenatal Factors
- Perinatal Factors
- Postnatal Factors

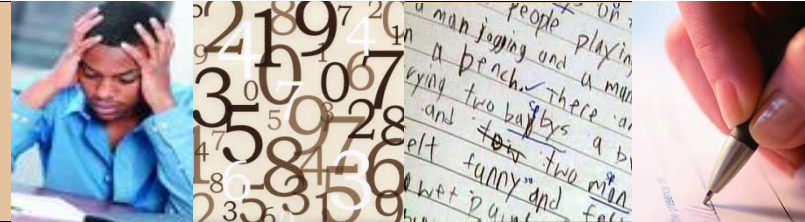




# Causes/ Etiology of Learning Disabilities

2. Genetic Factors

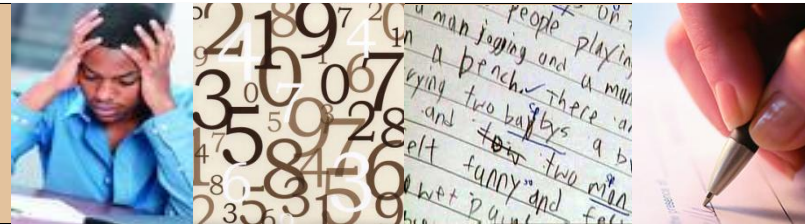
3. Environmental Influences





# Causes/ Etiology of Learning Disabilities

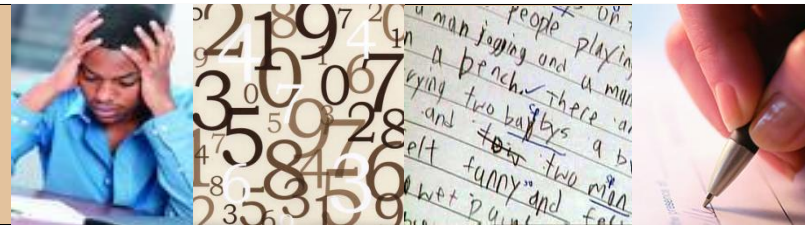
## 4. Biochemical Factors





# Learning Disorders Identified by the DSM IV

- **Language**
- **Calculation**
- **Problems with Motor Skills**
- **Communication Disorders**

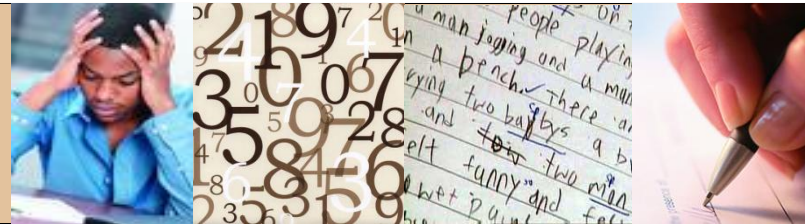




# Symptoms/ Signs of Learning Disorders

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.
- 



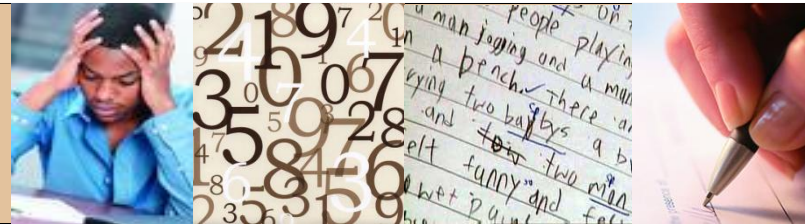




# Symptoms/ Signs of Learning Disorders

In older children symptoms are difficulty with one or more of the following:

- reading, spelling, writing or completing math problems

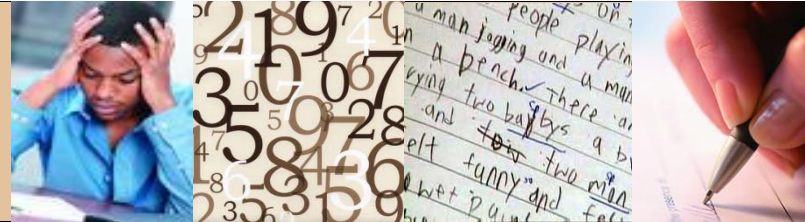






# Dyslexia

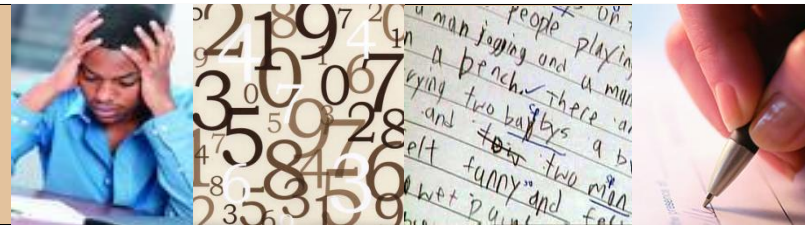
- **Dyslexia is an impairment in the brain's ability to translate written images received from the eyes into meaningful language.**





# • BRAIN SYSTEMS for READING

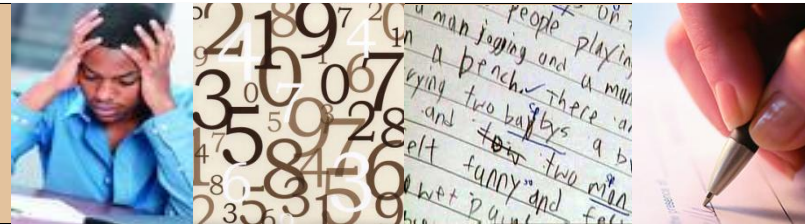
Shaywitz, 2003





# Dyslexia

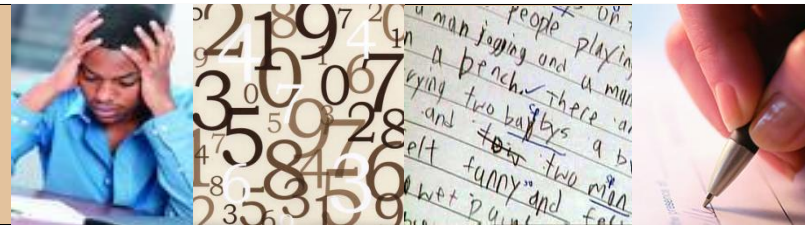
- Developmental
- Acquired





# Dyslexia – Davis' Triggers for Disorientation

- Formless Words

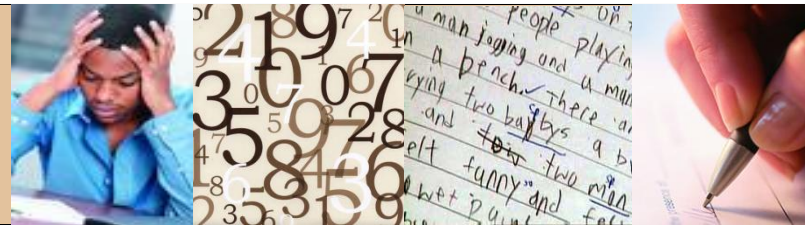




# Dyslexia / Hyperlexia

## HYPERLEXIA –

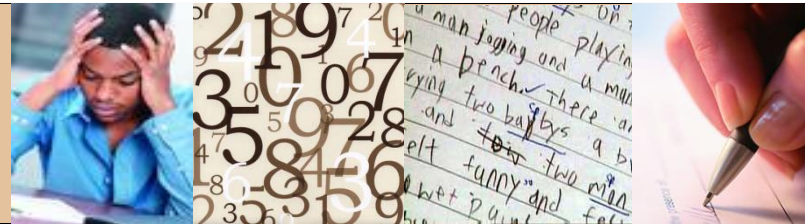
- A precocious ability to recognize written words





# Dyscalculia

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

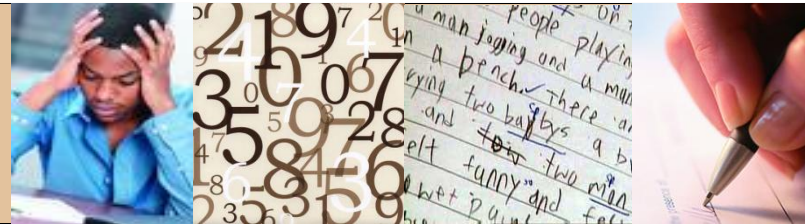




# Dyscalculia

## Common Symptoms associated with Dyscalculia/MD Subtypes

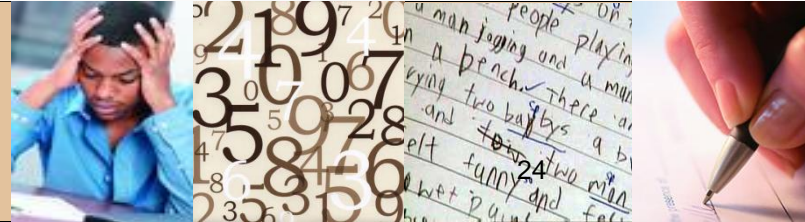
- Semantic memory
- Procedural
- Visual-spatial





# Neuroanatomy of Mathematics

- *Parietal Lobe* plays a major role!



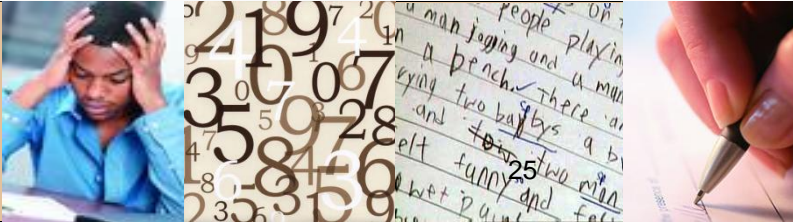




Parietal Lobe

Frontal Lobe

Prefrontal Cortex  
NOTES

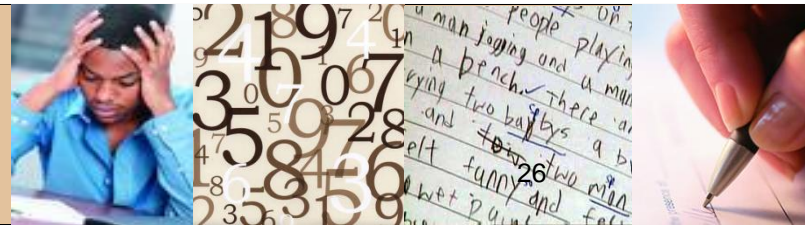




# Types of Dyscalculia:

Kosc (1974) identified 6 types of dyscalculia:

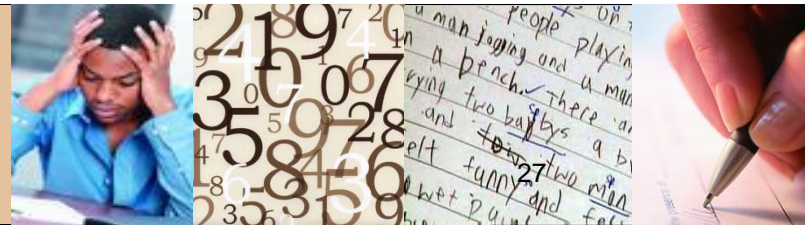
1. Verbal dyscalculia
2. Practognostic dyscalculia
3. Lexical dyscalculia.

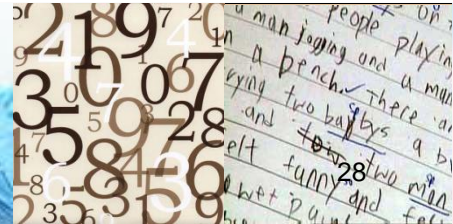




# Types of Dyscalculia:

3. Graphical dyscalculia
4. Ideognostic dyscalculia
5. Operational dyscalculia

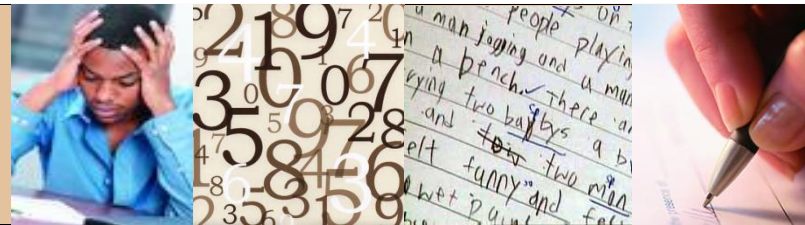






# Dysgraphia & Agraphia

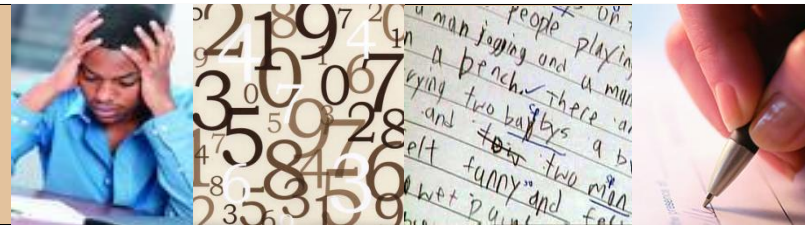
- **"Dysgraphia"** difficulty in expressing thoughts in writing and graphing.
- **"Agraphia"**- pathological loss of ability to write





# Motor Skills Disorder

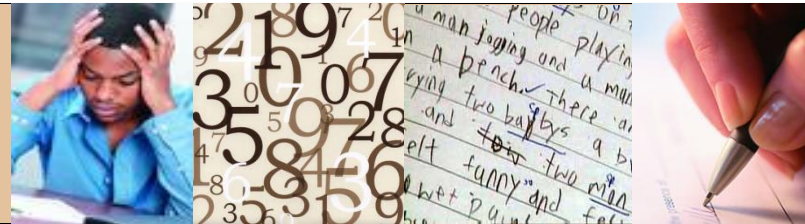
- **Commonly associated with other learning disorders**
- **Developmental Coordination Disorder**





# Communication Disorders

- **Communication difficulties involving verbal language including sign language**
- **Expressive Language Disorder**



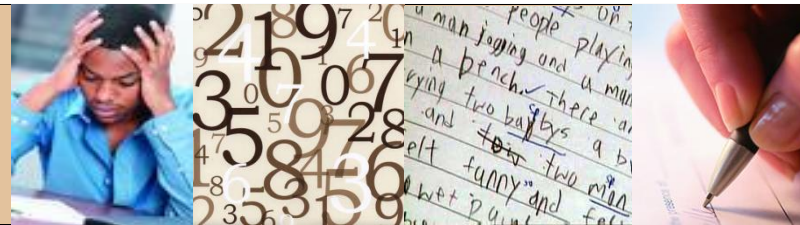




# Communication Disorders

## 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).

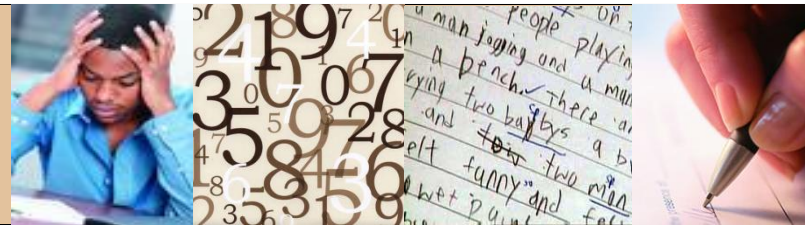






# The Brain and Learning Disorders

- Learning Disorders are related to deficits in various parts of the brain.

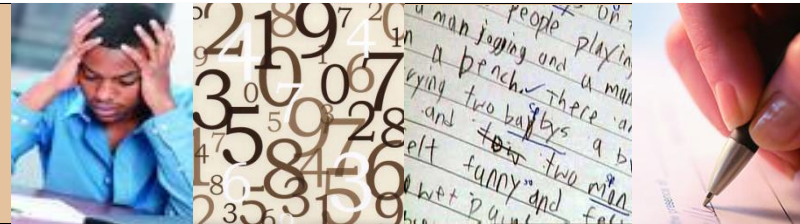


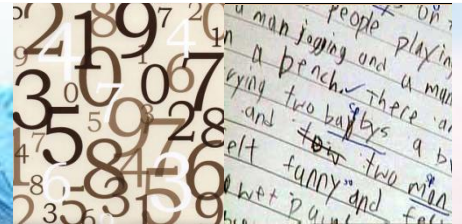


# NONVERBAL LEARNING DISORDER (NVLD)

## FOUR MAJOR DEFICITS:

- **Motoric**
- 
- **Visual**
- **Social**
- **Sensory**

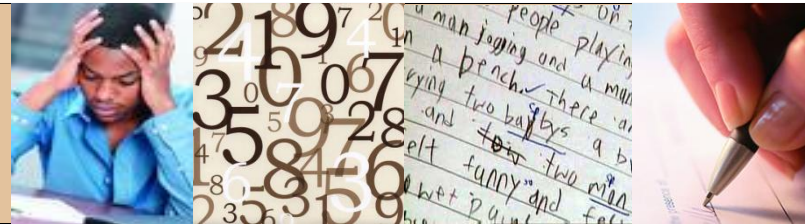






# Skills Affected by Learning Disorders

- Oral Language
- Reading
- Written Language
- Mathematics
- Gross and Fine motor skills

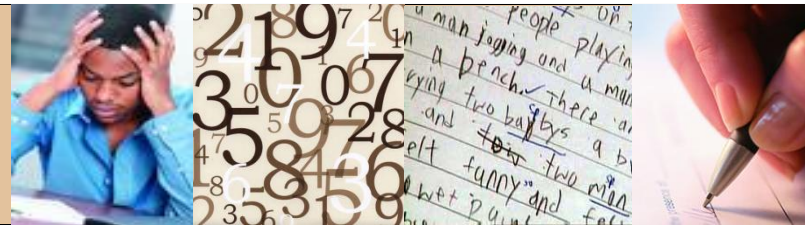




# Signals of Learning Disorders

## 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



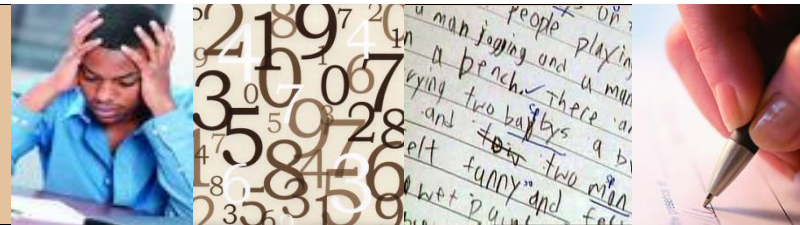
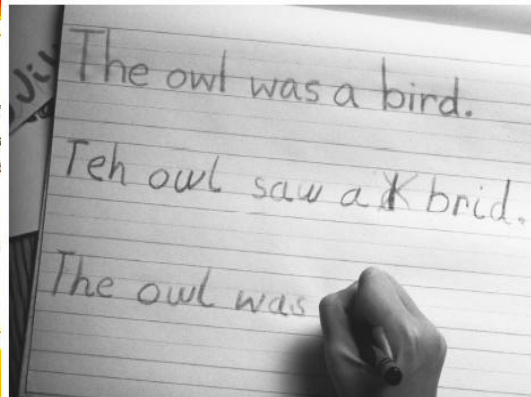
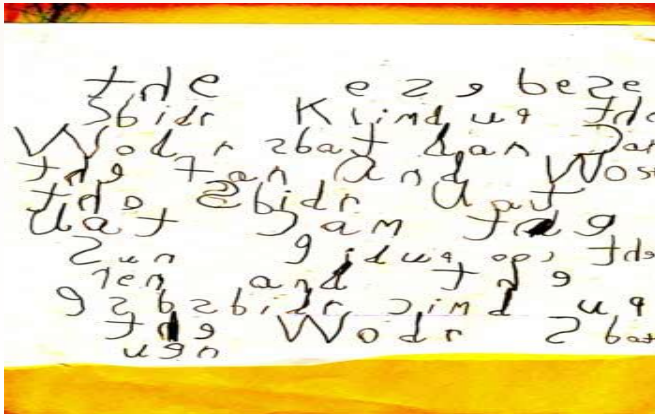




# Concluding...

Neurodiversity in the Classroom!!!!!!

Intervention = Early Neuropsychological  
Assessment & Diagnosis & Early Targeted  
Remediation







# Learning Disorders & Neuropsychology

Thank You Very Much

&

Thank You Kindly...

