



جامعة قطر
QATAR UNIVERSITY

البرنامج التأسيسي
Foundation Program

عمادة الدراسات العامة
Deanship of General Studies

Cognitive Disabilities in Education: How the brain works

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Objectives:

- Discuss the relationships between parts of the brain and common human tendencies in an effort to arrive at an understanding of brain functions that influence varying levels learning abilities.
- We will look at three specific types of disabilities ASD- Giftedness, ADHD-Dyslexia, discuss characteristics and reflect on our own classroom experiences to arrive at some of the ways these differences are sometimes manifested among older students.

Brain Mind Relation

Frontal Lobe

Planning
Reasoning
Problem solving
Morality
Personality
Social Skills
Recognising and
Regulating Emotions
Motor Functions
Motor speech area
of Broca

Temporal Lobe

Understanding
Language
Hearing
Speech
Memory
Learning
Sensory speech area
of Wernicke



Brain Stem

Regulation of heart
beats, respiration,
body temperature
and other essential
body functions

Parietal Lobe

Recognising sensation,
body position and objects
Sense of time and space
Reading and Comprehension area
Association between
functions of other
lobes

Occipital Lobe

Vision and Integrating
visual information
(colour, shape and
distance)

Cerebellum

Balance
Muscular co-ordination

©MSM

My sister will trips and falls more than any one I know

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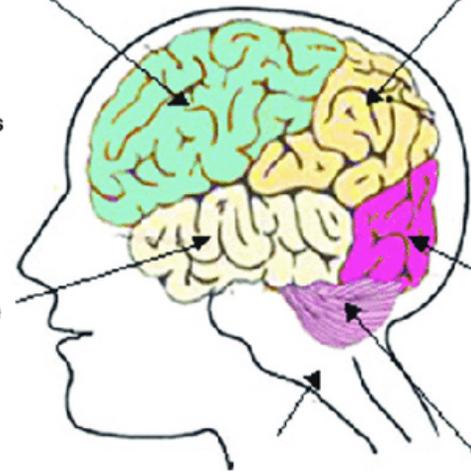
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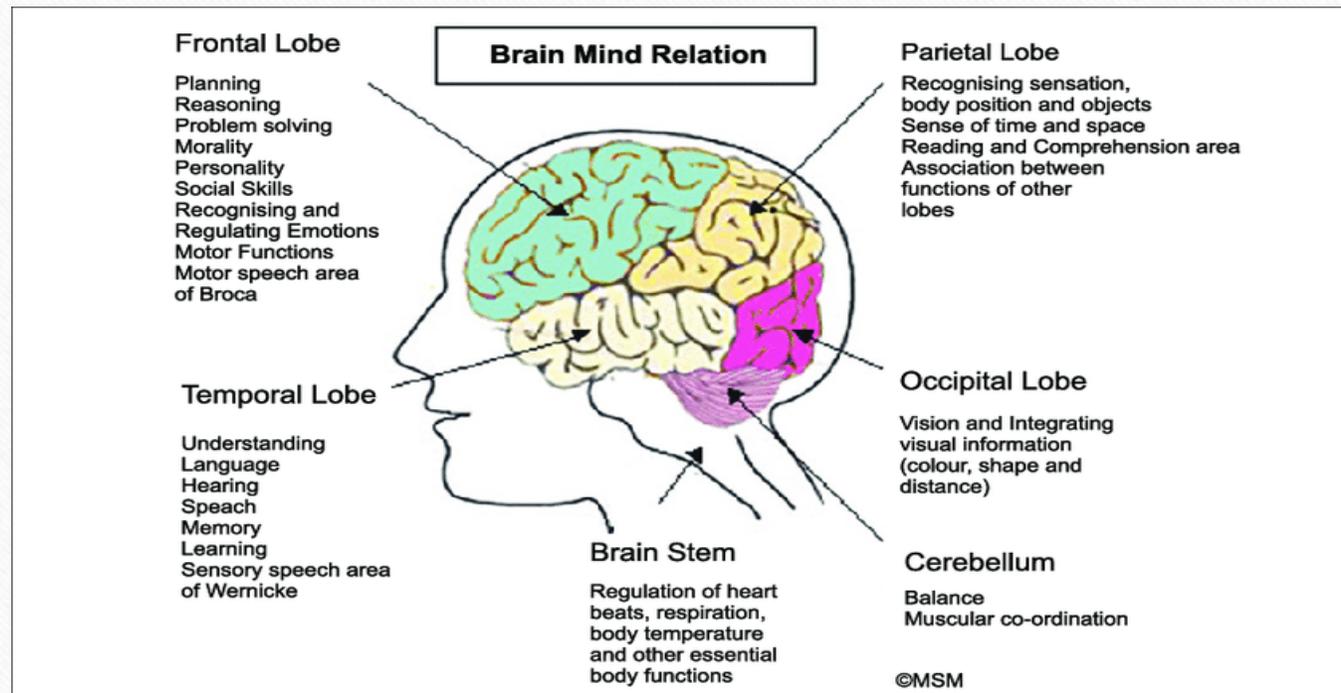
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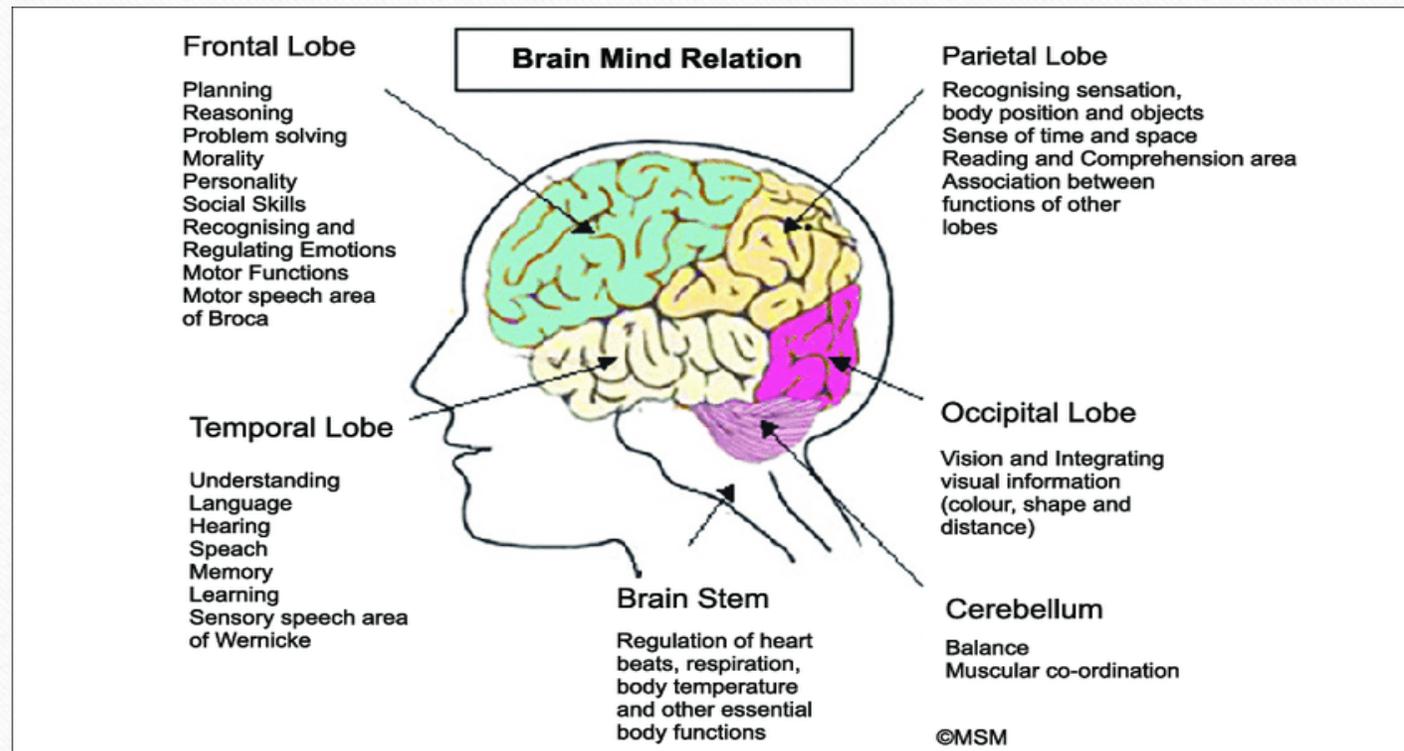
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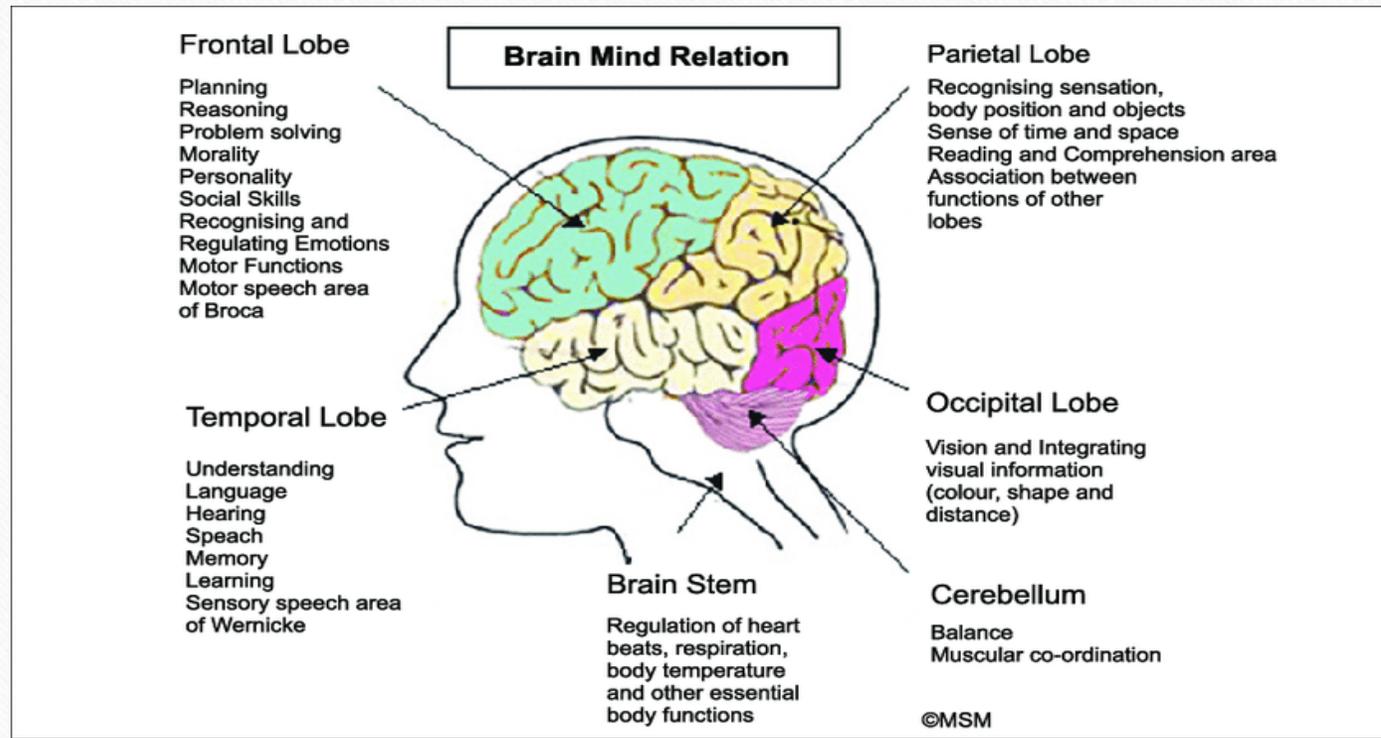
My brother is extremely short tempered.



I find it difficult to concentrate when I use regular headphones.



I always seem to see the wrong color.
Everybody sees blue. I see green.



Autism Spectrum Disorder

- Autism spectrum disorder (ASD) is a developmental disability that can cause significant social, communication and behavioral challenges.

- <https://www.cdc.gov/ncbddd/autism/facts.html>

ASD- Physical appearance

- There is often nothing about how people with ASD look that sets them apart from other people, but people with ASD may communicate, interact, behave, and learn in ways that are different from most other people.

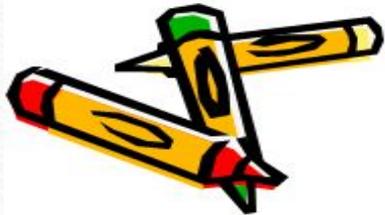
ASD- Abilities

- The learning, thinking, and problem-solving abilities of people with ASD can range from **gifted to severely challenged**. Some people with ASD need a lot of help in their daily lives; others need less. (*The Spectrum*)

Bright Child vs. Gifted Child

Bright Child

- Knows the answers
- Has good ideas
- Works hard
- Answers the questions
- Is interested
- Is attentive



Gifted Child

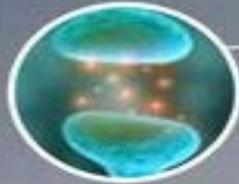
- Asks the questions
- Has wild, silly ideas
- Plays around, yet tests well
- Already knows
- Is highly curious
- Is inattentive



INSIDE THE AUTISTIC MIND

MIND THE GAP

Things go wrong with the way brain cells 'talk' to each other across tiny gaps called synapse



AUTISM ANOMALY

Found in frontal lobe (planning), amygdala (emotion) and hippocampus (learning)



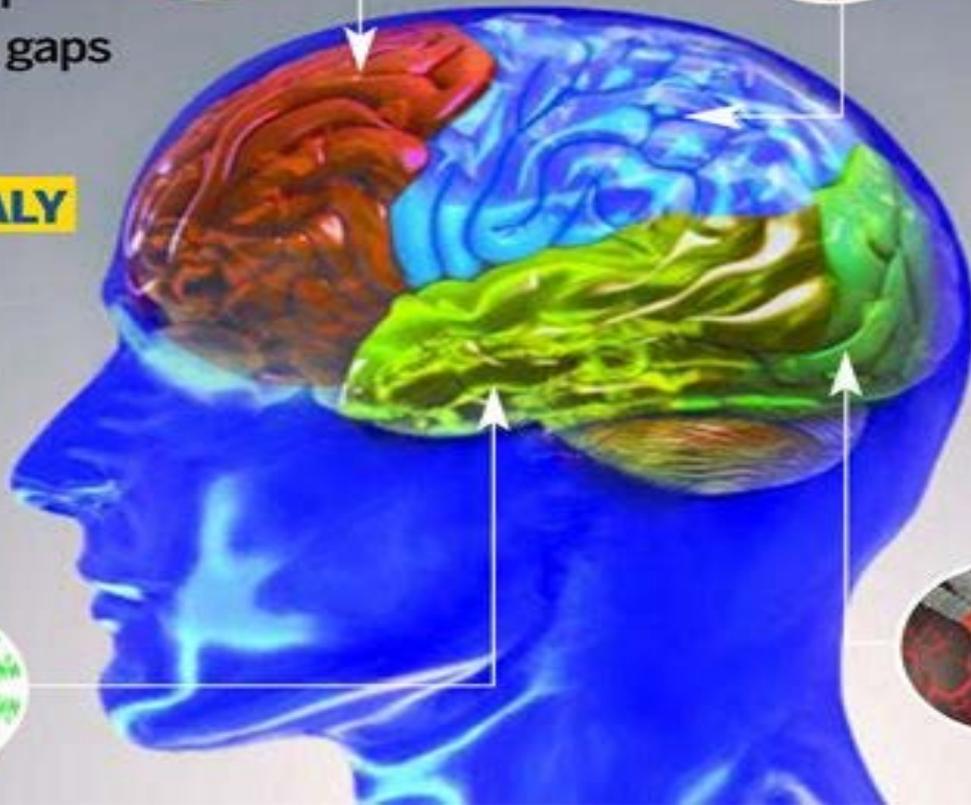
NOT IN SYNC

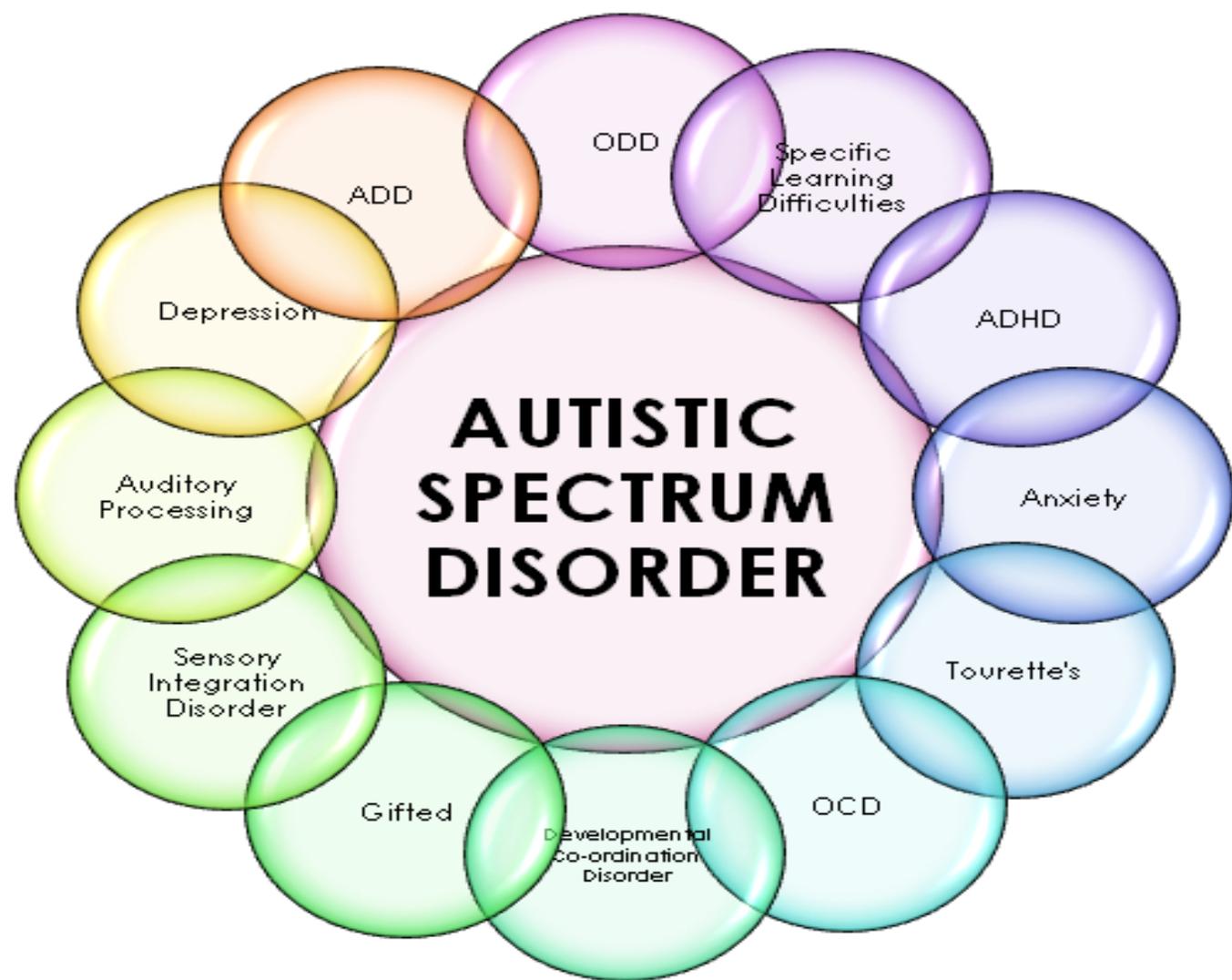
When the brain processes information, some signals are just noise. An autistic brain finds it difficult to distinguish vital signals from noise.



FRAGILE GENES

Genetic mutation in X chromosome, a common cause. Explains why autism tends to run in families.





ADHD

FRONTAL LOBE

(CONCENTRATION)

(SELF-CONTROL)



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WHAT IS ADHD?

Attention Deficit Hyperactivity Disorder (ADHD)

is a condition that becomes apparent in some children in the preschool and early school years. It is hard for these children to control their behavior and/or pay attention. It is estimated that between 3 and 5 percent of children have ADHD, or approximately 2 million children in the United States. This means that in a classroom of 25 to 30 children, it is likely that at least one will have ADHD.

Possible Causes:

- ❑ Heredity is one of the main causes of ADHD.
- ❑ Difficulty during pregnancy.
- ❑ Prenatal exposure to alcohol and/or tobacco.
- ❑ Premature delivery
- ❑ Significantly low birth weight
- ❑ Excessively high body lead levels
- ❑ Postnatal injury to the prefrontal region of the brain.

*Source: www.chadd.org

Types of ADHD

Inattentive

Easily distracted, but not hyperactive or impulsive

Hyperactive-Impulsive

Symptoms of hyperactivity and impulsivity but not inattention

Combined

Person has both symptoms of inattention, hyperactivity and impulsivity

Types of Attention

Most behavior and learning difficulties can be a direct result of not being able to pay attention, sit still, listen, and focus on important tasks.

CHILDREN 4 - 16YRS

6-18%

STUDENTS WITH ATTENTION AND FOCUS PROBLEMS



MOVERS



These kids are very active all the time and are often on the go. It is difficult for them to attend to only one task because they are affected by everything in their environment and they try to take it all in instead of focusing on the task they need to focus on.

"Squirmers" typically don't get out of their seat, but they are constantly moving while they are seated. They fidget with their hands and feet and they change body positions frequently.

SQUIRMERS

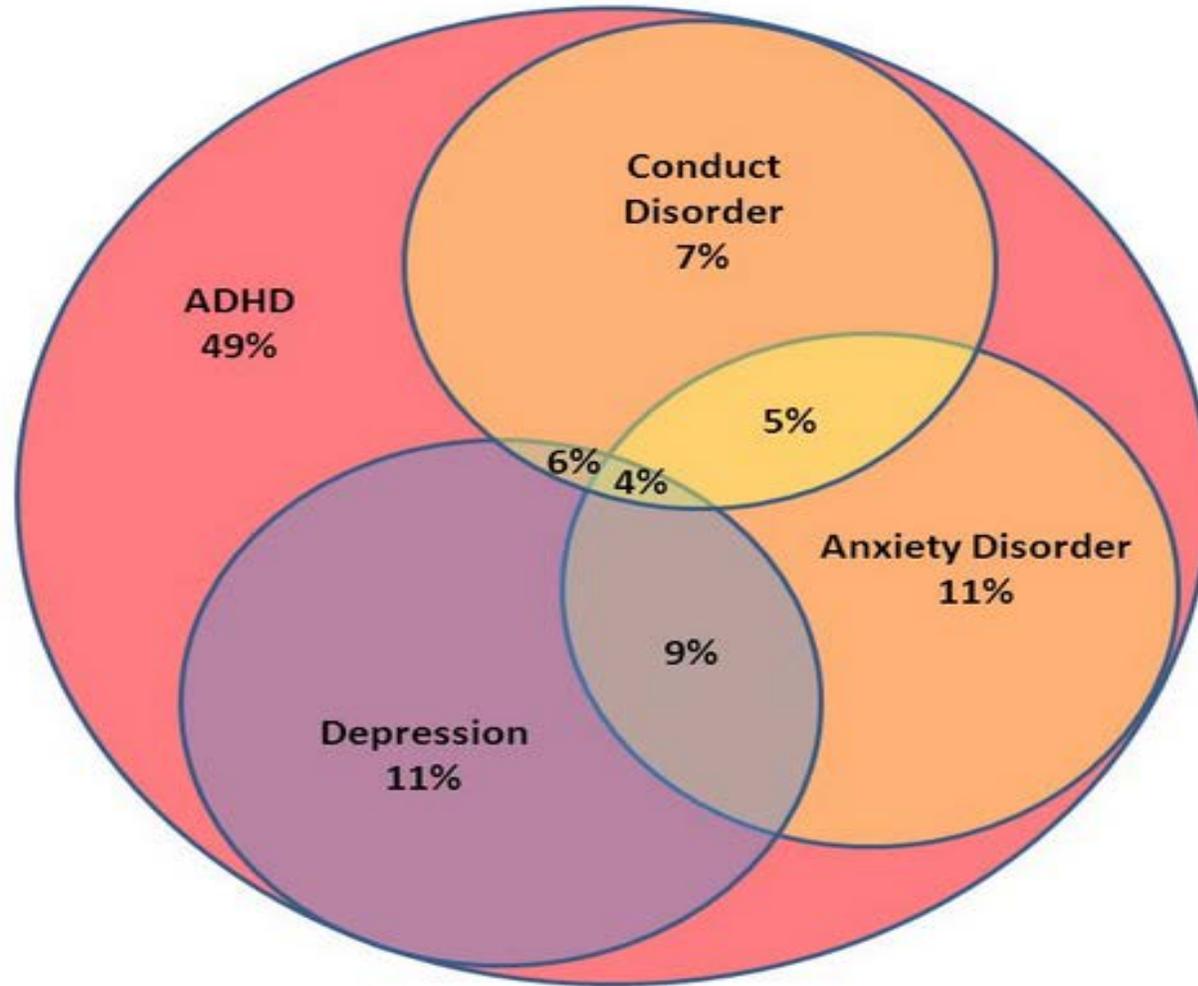


DAYDREAMERS



The daydreamer is usually present physically, but mentally they are miles away. They are generally never out of their seat, but they are often fidgeting with something at their desk.

Comorbidities with ADHD



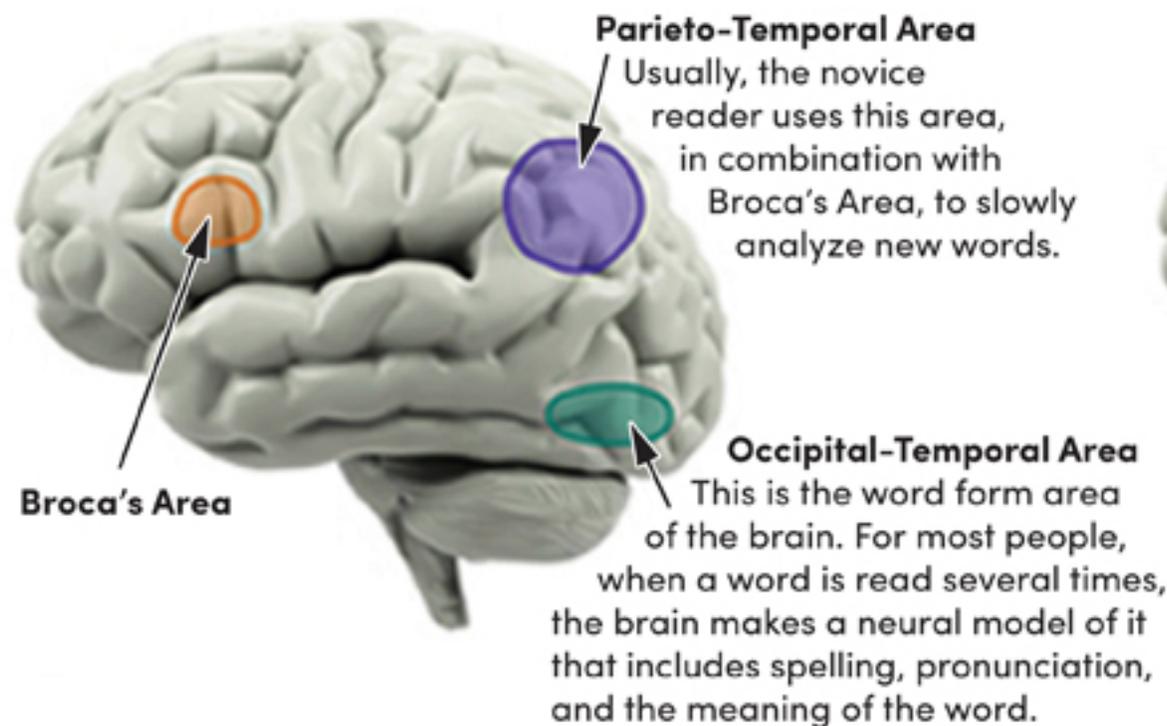
http://www.hms.harvard.edu/hmni/On_The_Brain/Volume05/Number1/ADD.html

Dyslexia

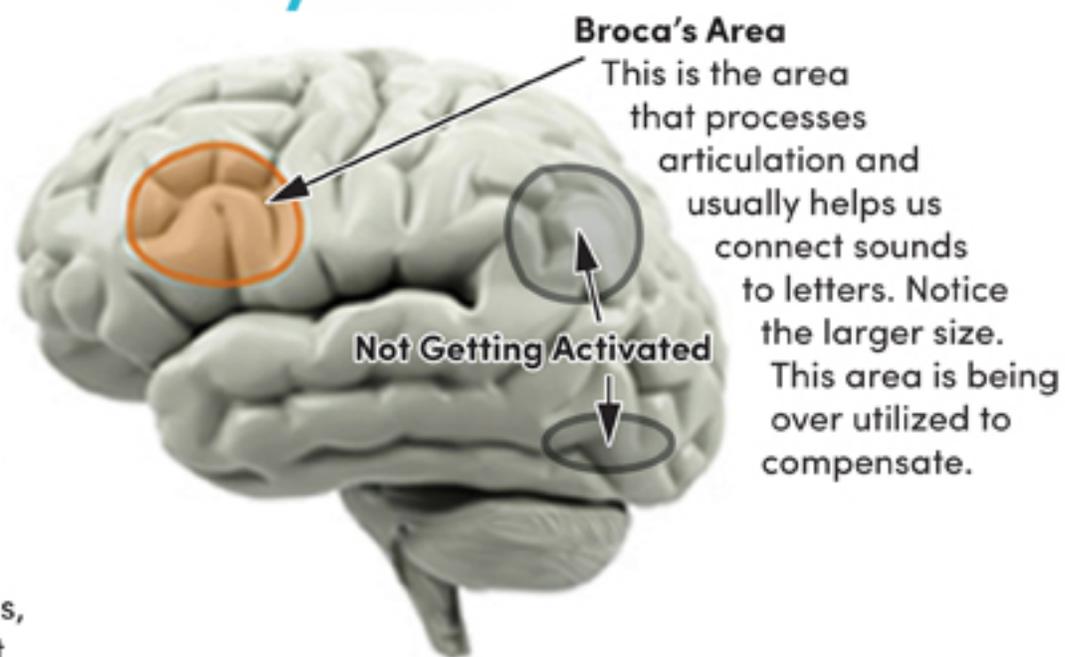
- Dyslexia involves troubles connecting the sounds that make up words with the letters that represent those sounds.
- <https://www.understood.org/en/learning-thinking-differences/child-learning-disabilities/dyslexia/video-dyslexia-and-the-brain>

NON-DYSLEXIC BRAIN vs. DYSLEXIC BRAIN WHEN READING

Non-Dyslexic



Dyslexic



Research in neuroscience reveals that the brain functions differently in people with dyslexia than those without it. These structural and neural differences make it more difficult for people with dyslexia to read, spell and write. For example, in the left brain hemisphere, three dominant areas of the brain are usually activated for reading, but in those with dyslexia, only one area of the brain is being stimulated.

Secondary Disabilities

- Result of social interactions
- Result of natural instinct to survive
- Maybe negative habits- including learned helplessness

- Learned helplessness
 - Comes from a place of self pity and manifested by students who believe that their abilities are far less than they actually are, and therefore expects others to do for the.
 - a reliance/over dependence on others

The National Autistic Society's SPELL Framework

- SPELL is a framework for understanding and responding to the needs of children and adults on the autism spectrum
- . It focuses on five principles that have been identified as vital elements of best practice in autism, and emphasizes ways to change the environment and our approaches to meet the specific needs of each person.

<https://www.autism.org.uk/about/strategies/spell.aspx>

SPELL

- **S** - STRUCTURE (get to know child, +, eg. describe behavior/meltdown/shutdown)
- **P** - Positive +no judgement + encouraging language
- **E** - Empathy- understand person, double empathy, sensory processing assessment, self aware (Operate from a place of mindfulness)
- **L** - Low arousal- non confrontational, meet sense needs, environment, allow self calming, keep busy
- **L** - Links - involve child, family support -consistent, child centered

Relevant Quotes from Fellow Presenters QUFP AE-Days Webinars 2020

- Chris Stryker- urged us to rethink our approaches as we adopt to our online situations-
Recalibrate

We are in prisons created by our perceptions. “Shakespeare”. We always possess the power to change our attitudes.

- Aaron Balick advised us to check our thinking. If we are not emotionally intelligent we may not use what we learn effectively. *This awareness of emotional health can go a long way if transferred to and utilized in our classrooms.*
- Naima Sarfraz used a quote – Vulnerability is a bridge to build connection. *It is ok to tell ask the student to tell you how you can best help him or her.*
- Judy Thompson- 80% of the neurons in the brain are dedicated to finding patterns via the synapses. *Consider the students who has deficits in ability to find patterns that facilitate learning.*

References

- Goldstein, S. & Schwebach, A. (2004). The Comorbidity of Pervasive Developmental Disorder and Attention Deficit Hyperactivity Disorder: Results of a Retrospective Chart Review. *Journal of Autism and Developmental Disorders*, 34(3), 329-339.
- Guenivere Eden <https://www.understood.org/en/learning-thinking-differences/child-learning-disabilities/dyslexia/video-dyslexia-and-the-brain>
- Jahromi, L.B., Kasari, C.L., McCracken, J.T., Lee, S.E., et al. (2009). Positive effects of methylphenidate on social communication and self-regulation in children with Pervasive Developmental Disorders and Hyperactivity. *Journal of Autism and Developmental Disorders*, 39, 395-404.
- Jensen, E. (2000). *Brain-based learning: The new science of teaching and training*(revised editi-on). Alexandria, VA: ASCD Press.
- Limbert, Elizabeth Mary; (2017) An evaluation of the effectiveness of the Local Early Autism Programme (LEAP). Doctoral thesis , UCL (University College London).
- [An evaluation of the effectiveness of the Local Early Autism Programme \(LEAP\)](#)
- S Goldstein - 2018 - psycnet.apa.org [Historical perspective and overview.](#)
- <https://www.cdc.gov/ncbddd/autism/facts.html>