

The Adolescent Brain Under Construction. The Power of Relationships".



Adolescents: Why DO they do the things they do?





Adolescence is a time of growth and
maturation in the brain.

Relationships matter



Scenarios

- What we Think....
- Affects how we feel....
- Affects how we act...

Why do we care about brain?

You are your brain.



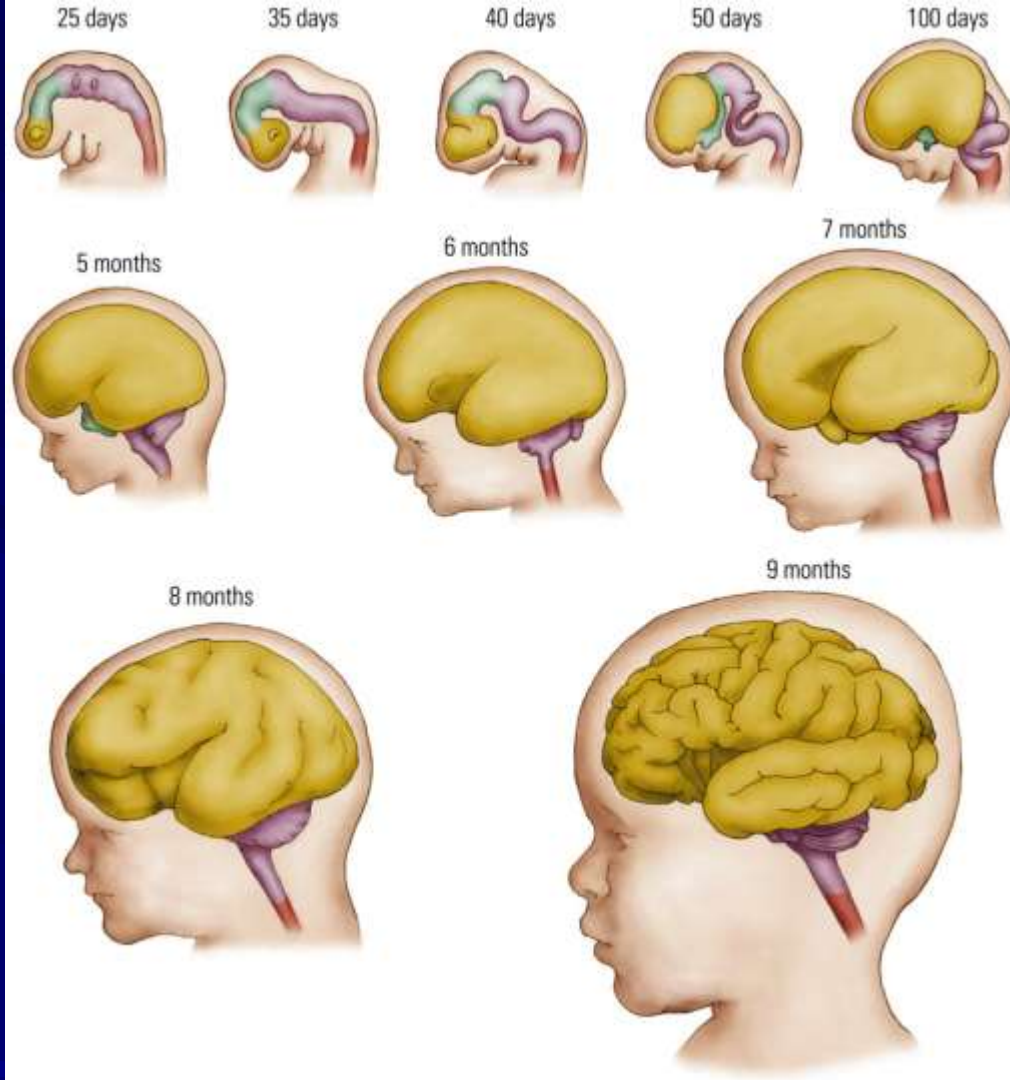
Time Magazine Dr J Stieben

BUT

**Your brain is not just
produced by your genes**

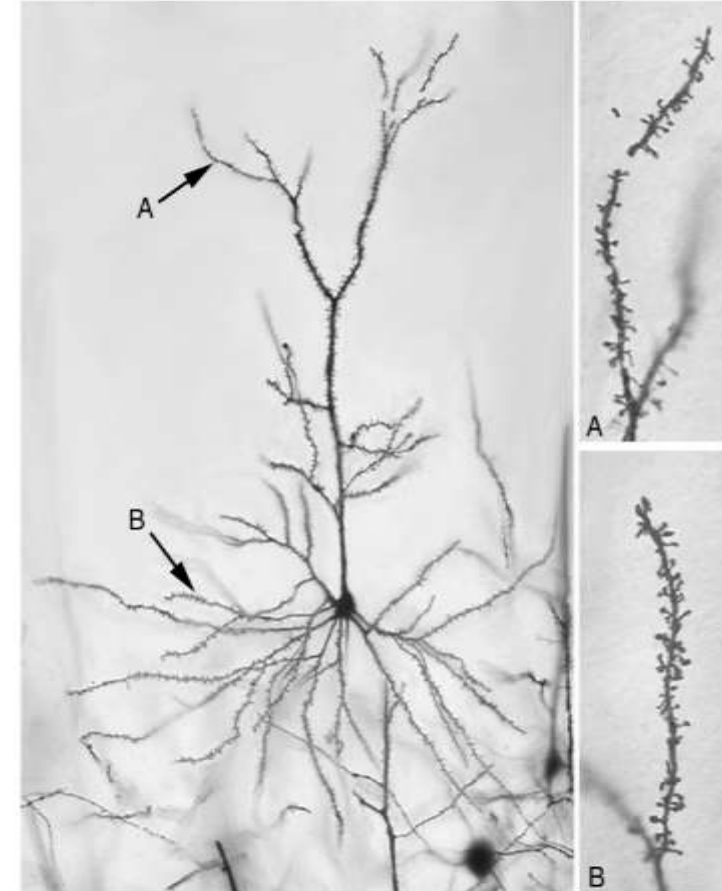
**Your brain is sculpted by
a lifetime of
experiences .**



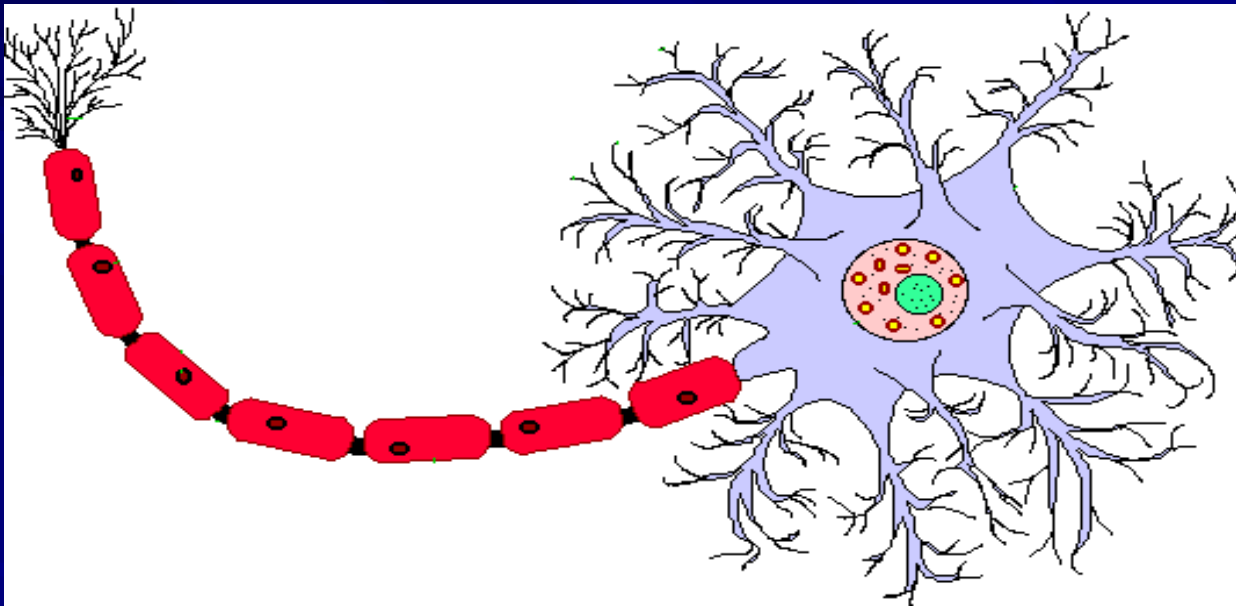


**Connections
are
formed and
altered
by experience**

**Massive growth In first three years
But, not done until at least
Age 24+ years...
(Later in Males)**

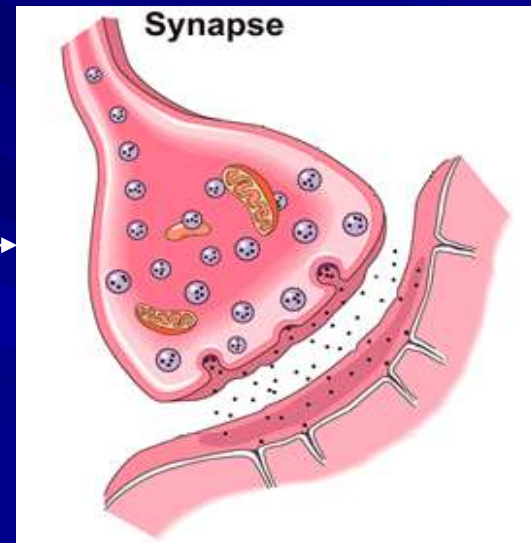
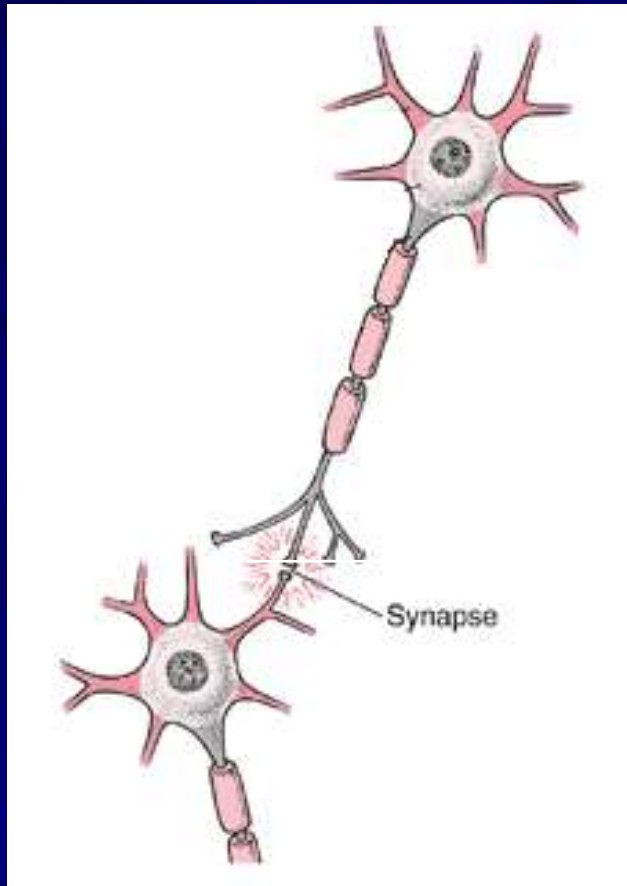


All of the areas of the brain
...like sound, communication, problem-solving...
are made of cells called
NEURONS

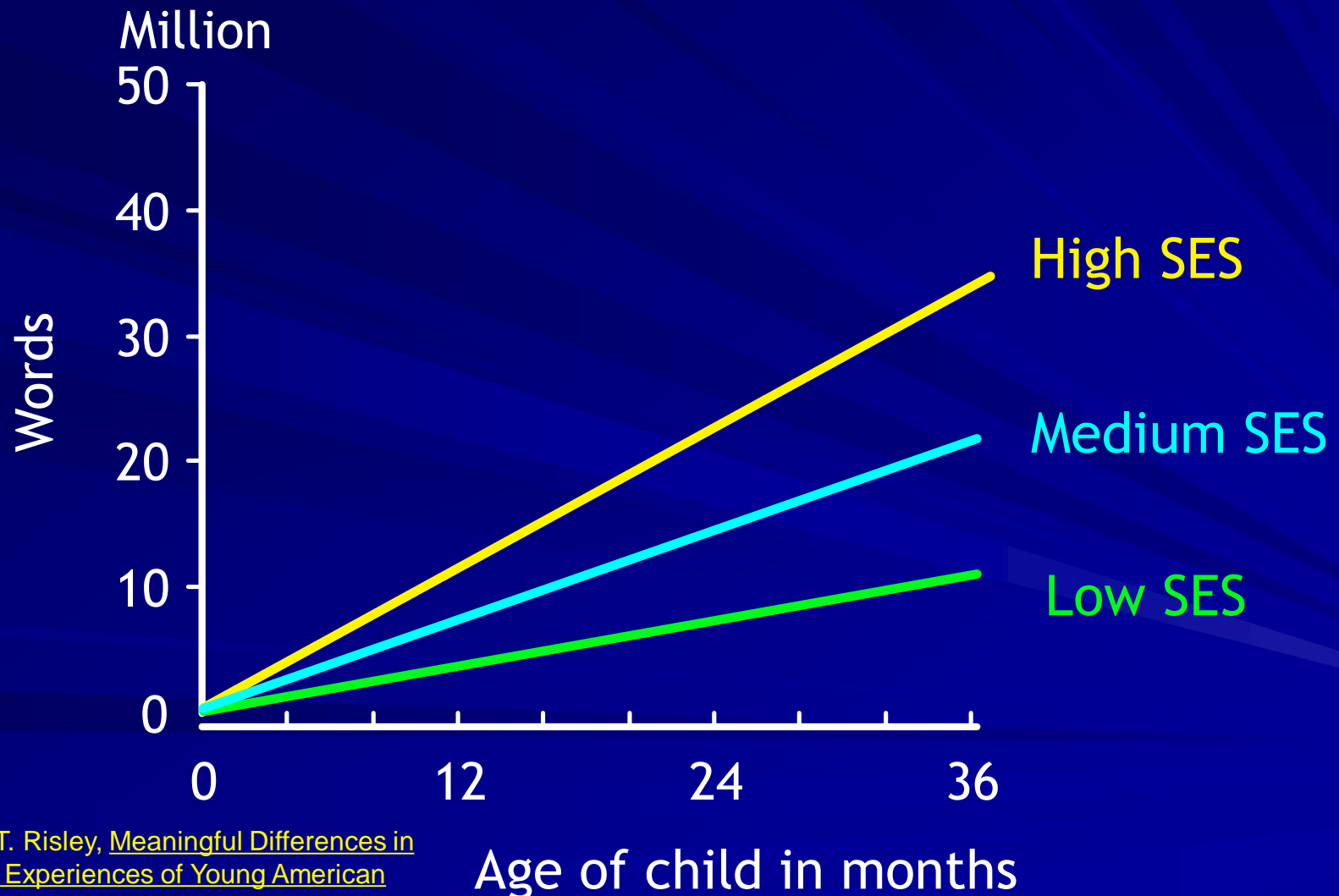


They transmit information all around the brain.

Neurons pass information
through CONNECTIONS
with other neurons at
SYNAPSES

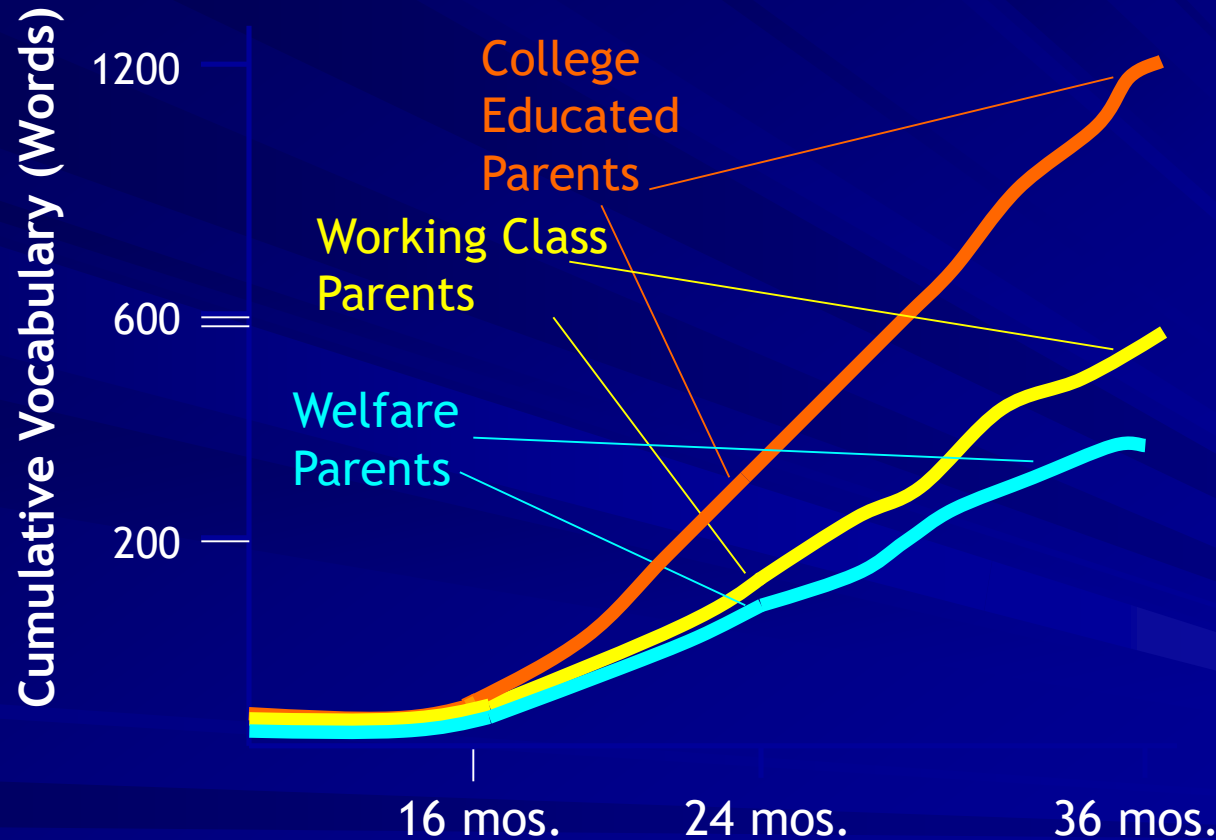


Estimated Cumulative Difference in Language Exposure by 3 Years of Age



B. Hart & T. Risley, Meaningful Differences in Everyday Experiences of Young American Children, 1995

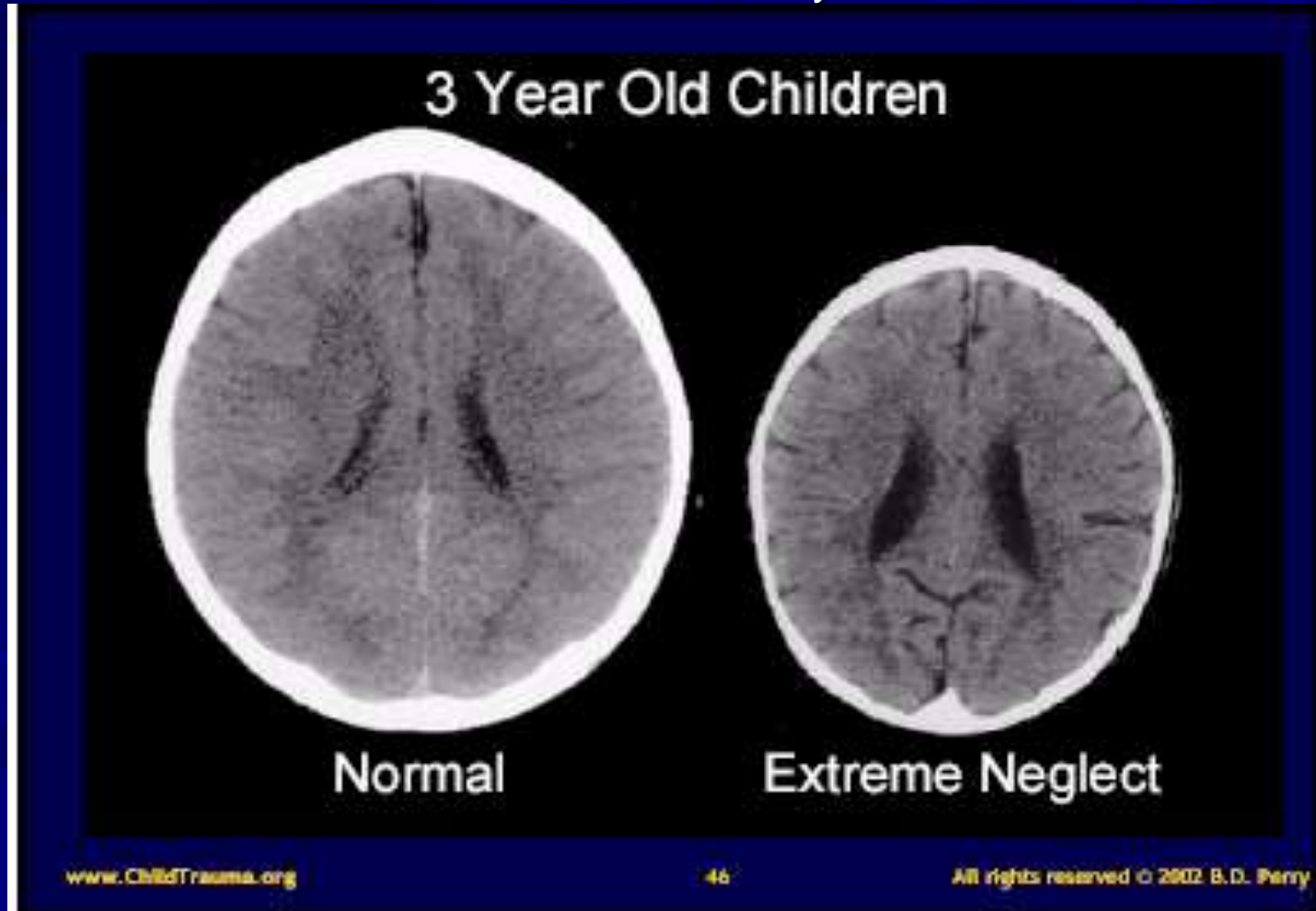
Disparities in Early Vocabulary Growth



B. Hart & T. Risley, Meaningful Differences in Everyday Experiences of Young American Children, 1995

USE IT OR LOSE IT !

The more a system, or set of brain cells is activated, the more that system changes in response. The stronger the repetitions the stronger the memory.

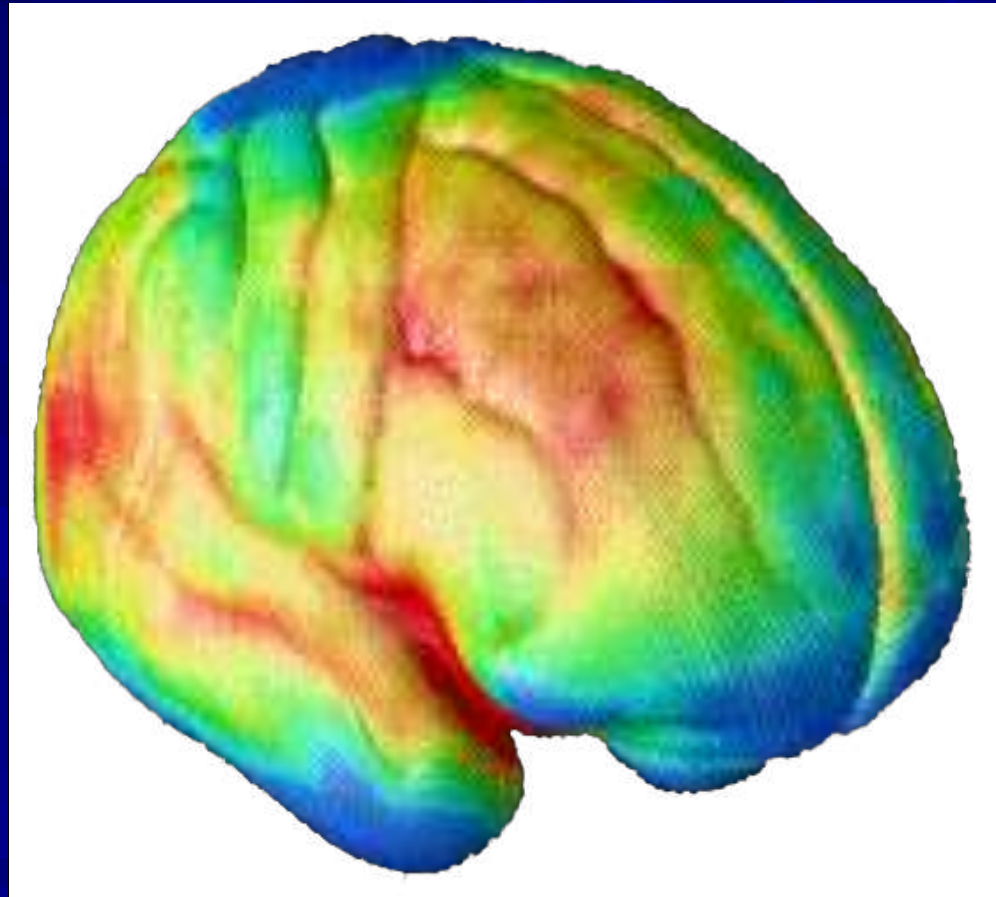


Brain Development

Maturation Occurs from Back to Front of the Brain

Images of Brain Development in Healthy Youth (Ages 5 – 20)

Blue represents maturing of brain areas



Source: Gogtay, Giedd, et al., 2004.

Copyright © 2004 The National Academy of Sciences, USA
Gogtay, N., Giedd, J.N., et al. (2004)
Dynamic mapping of human cortical development during childhood through early adulthood
Proceedings of the National Academy of Sciences, 101 (21), 8174 – 8179

Kids Today

"The children now love luxury; they have bad manners, contempt for authority; they show disrespect for elders and love chatter in place of exercise. Children are now tyrants, not the servants of their households. They no longer rise when elders enter the room. They contradict their parents, chatter before company, gobble up dainties at the table, cross their legs, and tyrannize their teachers."

Emerging Adulthood 18-25

- A New Developmental stage?
- A time of self focused exploration
- Facilitated by a socially sanctioned moratorium from adult responsibilities
- Larger number of demographic transitions
- More autonomy
- Fewer responsibilities
- Arnett, Cote and others

3 Key Points of Brain Maturation

- The brain matures by becoming more specialized (gray matter) and more “connected” (white matter)
- A changing prefrontal/limbic balance affects reward circuitry, hot vs cold cognition, temporal discounting, and decision making
- Enormous plasticity confers both vulnerability and opportunity

The ES.SE.N.CE of Adolescence

- ES: Emotional Spark :Emotional Storms and Powerful Passions
- SE : Social Engagement : The desire for peer relationships
- N: Novelty : Dopamine experience more pleasure. Risk taking
- CE: Creative Exploration; Pushing away from status Quo. The thrill of new discovery

De Dan Siegel Brainstorm

Key Messages

‘UNDER CONSTRUCTION’

- Teens need MORE of our time, not less.
- What we THINK, affects how we FEEL, affects how we ACT)
- The majority of adolescents do well YET

Pruning and Remodeling

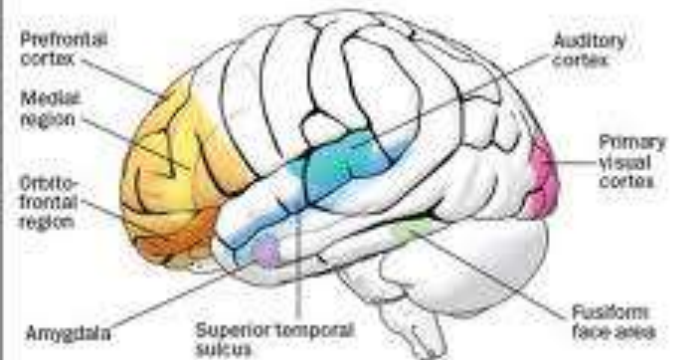


The Social Brain



The **Social Brain**

Perceiving emotion in others requires the collaboration of disparate brain regions. To read feeling in a face, the amygdala, an emotion hub, works with the fusiform face area, which is dedicated to face recognition. The medial prefrontal cortex and superior temporal sulcus read mood regardless of whether the cues come from a face, body or voice. They receive data from visual and auditory cortices, which process sights and sounds.





What emotion do you see?



YURGELUN-TODD

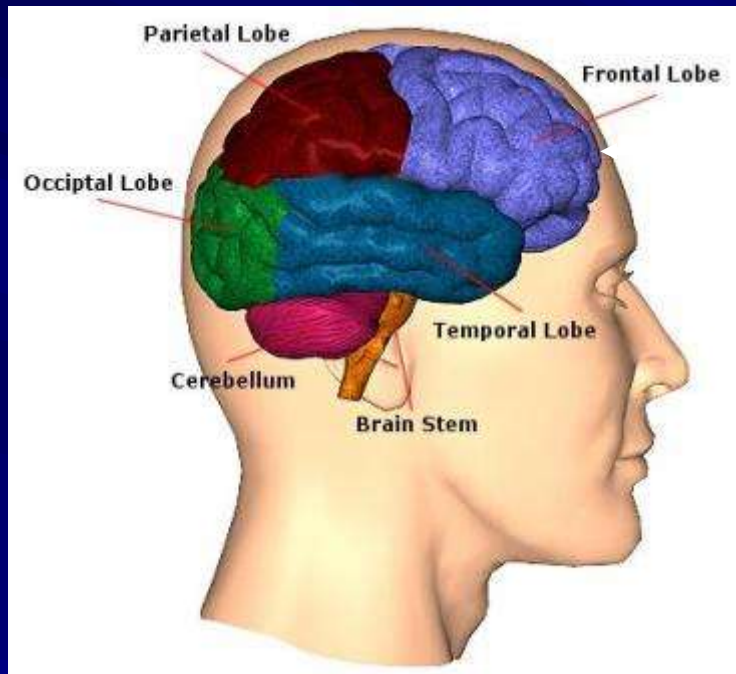
Hyper-Rational



PEER POWER



The Frontal Lobes



■ **DEVELOPED** frontal cortex allows one to regulate emotions, solve problems effectively and plan behaviour.

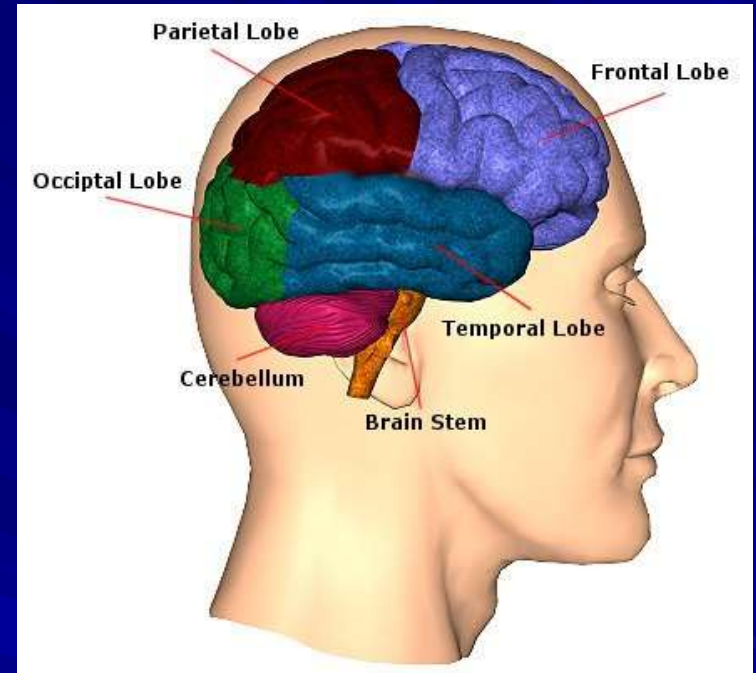
“Executive Functions”

- **Governing emotions**
- **Judgment**
- **Planning**
- **Organization**
- **Problem Solving**
- **Impulse Inhibition**
- **Abstraction**
- **Analysis/synthesis**
- **Self-awareness***
- **Self-concept***
- **Identity**
- and
- **Spirituality**

AREAS UNDER CONSTRUCTION

Prefrontal Cortex

- Responsible for planning organizing, judgment strategies (cognitive flexibility).
- Impulse Inhibition, abstraction
- Problem solving



- DEVELOPED frontal cortex allows one to regulate emotions, solve problems effectively and plan behaviour.

4 of 16

time

4:12

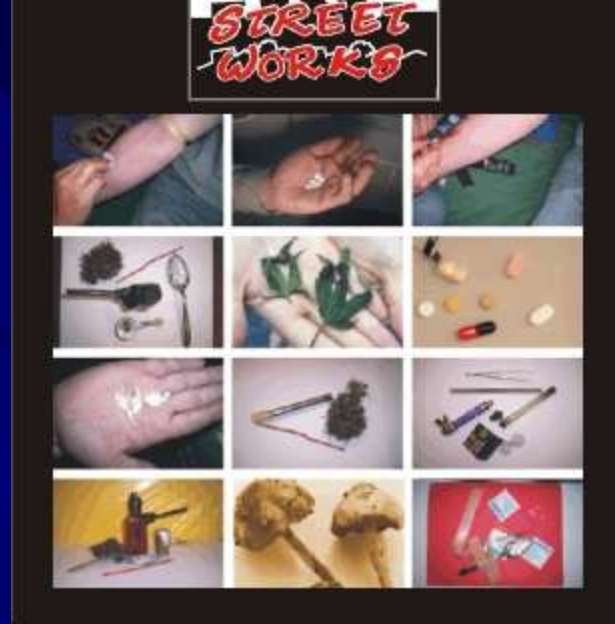




Sleep is very
important during
periods of brain
maturation!



This means that although many teenagers get **less** sleep than younger children, there is actually an **increase** in sleep needs during the teenage years!



However, in a world of fast cars, readily available drugs and alcohol, this combination simply puts teens at increased risk





Almost half of Ontario youth miss school because of anxiety, study suggests

A survey commissioned by Children's Mental Health Ontario suggests that children and parents miss school and work to cope with mental illness.

Toronto Star Nov 14 2017

kidsmentalhealthcantwait.ca



SIGNIFICANT CHANGES

	2013		2015
Moderate to serious psychological distress	24%	↑	34%
Serious psychological distress	11%	↑	14%
	2007		2015
Rate mental health as fair or poor	11%	↑	17%
	1999		2015
Visited mental health care professional in previous year	12%	↑	21%
	2001		2015
Were prescribed medication for anxiety, depression or both in previous year	3%	↑	6%
	2007		2015
Used a prescribed opioid pain reliever (e.g., Tylenol 3, Percocet) in previous year	41%	↓	21%
	2003		2015
Performed any gambling activity in previous year	57%	↓	32%





GROWING UP DIGITAL

ALBERTA

Parent and Grandparent Perspectives on
Digital Technology, Health and Learning

DISTRACTED OR ADDICTED?



“ People are having a hard time being away from their phones. They are living their life through a screen instead of actually taking in what is happening around them through their own eyes. ”

— Alberta parent



30% of parents feel “addicted” to their own technologies with social media as the area of greatest dependence.



22% of parents feel their children are “addicted” to technology with the areas of greatest dependence being watching videos and video games.



36% of grandparents believe their grandchild is “addicted” to technology.

“ We live in a digital world and using this technology is a great advantage to everyone. I believe that we need proper instruction in understanding this technology in the education system that I wish existed in my time. ”

— Alberta grandparent

PARENTS' QUESTIONS



How can we balance the use of technology as a teaching and learning tool with kids' ever-increasing addiction to device use?

In a digital world, guidance on the "right" amount of exposure to digital media would be helpful. It's unrealistic to say my child will never be exposed, but for instance is TV better than a smart phone?

How are digital technologies affecting our relationships with each other?



SURVEY PARTICIPANTS



3150+ Parents/
Guardians
550+ Grandparents

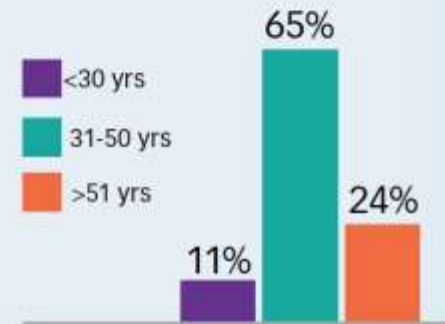
Total sample size 3702 individuals.

LOCATION



Urban – 51%
Rural – 49%

AGE RANGE



Growing Up Digital (GUD) Alberta

Growing Up Digital (GUD) Alberta is a 10-year, collaborative research project that examines the scope of the physical, mental and social consequences of digital technologies on Alberta's children and youth.

For more information about this research study, please contact

Dr. Philip McRae, Alberta Teachers' Association
philip.mcr@ata.ab.ca.

PARTNERS



The Alberta Teachers' Association



Boston Children's Hospital
Until every child is well™



**Center on Media
and Child Health**
ASK THE MEDIATRICIAN



**HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL**

Dr Phil McRae

Growing up digital alberta

- The first, be balanced. Don't have phones around the dinner table and don't sleep with your devices.
- Second, be mindful. Think about the age technology is being introduced to kids, how it is being introduced and what it is being used for.
- The third, and most important, is relationships and being present both with and without technology.
- “When you're with someone make sure that the technology, if it's used, it's enhancing the relationship. If it's not being used, you need to enhance the relationship,” said McRae.

GREATEST OPPORTUNITY...

GREATEST VULNERABILITY

As the adolescent brain is reconfigured it is more susceptible to long lasting damage of drugs, alcohol, and negative experiences. Unfortunately, the brain is most vulnerable at a time when they are most inclined to take risks and to act impulsively...”

(Jay Giedd, NIH 2004)

Books

- The Brain that Changes itself Norman Doidge
- Mindset Carol Dweck
- Brainstorm Daniel Siegel
- Age of Opportunity Lawrence Steinberg
- The Teenage Brain Frances E Jensen

There Is A Battle Of Two Wolves Inside Us All



One is evil. It is anger, jealousy, greed, resentment, lies, inferiority and ego.

The other is good. It is joy, peace, love, hope, humility, kindness, empathy and truth.

The wolf that wins? The one you feed.

-Cherokee Proverb