Impact of Trauma on Child Development

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*Photos used are that of child actors and not actual victims

OBJECTIVES

- To define stress and trauma
- To discuss the body's response to trauma
- To explain the effect of trauma on the development of the child

STRESS

- Built-in response to danger, real or imagined, immediate or some time away
- Choice: fight, flee, or freeze

THREE TYPES OF STRESS

1. POSITIVE STRESS

- Moderate, short-lived stress responses
- Normal & essential for healthy development
  - Learning to adjust
- Events that a child can learn to control and manage well with the support of caring adults & which can occur against a backdrop of generally safe, warm, and positive relationships

National Scientific Council on the Developing Child (2005). Excessive Stress Disrupts the Architecture of the Developing Brain: Working Paper #3, http://www.developingchild.net

THREE TYPES OF STRESS

2. TOLERABLE STRESS

- Activates the body's alert system to a greater degree as a result of more sever, longer-lasting difficulties
- Limited time periods
- In the context of ongoing supportive relationships with adults allows time for the brain to recover

National Scientific Council on the Developing Child (2005). Excessive Stress Disrupts the Architecture of the Developing Brain: Working Paper #3, http://www.developingchild.net

THREE TYPES OF STRESS

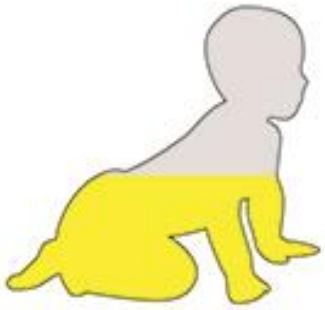
3. TOXIC STRESS

- Refers to strong, frequent, or prolonged activation of the body's stress management system
- Chronic, uncontrollable, and/or experienced without the child having access to support from caring adults

National Scientific Council on the Developing Child (2005). Excessive Stress Disrupts the Architecture of the Developing Brain: Working Paper #3, http://www.developingchild.net

RESPONSES TO STRESS

▸ POSITIVE
Brief increases in heart rate, mild elevations in stress hormone levels.



▸ TOLERABLE
Serious temporary stress responses, buffered by supportive relationships.

▸ TOXIC
Prolonged activation of stress response systems in absence of protective relationships.

EFFECT TO THE BRAIN

- Living in poverty:
  Poor cognitive development
  (language, memory, socioemotional processing)
  poor income and health in adulthood

- Low Socio-Economic Status (SES) associated with lower gray matter volumes in the frontal and parietal cortex vs more advantaged children at age 4 yo (2013)

- Low SES associated with decreased cortical surface are in frontal temporal, parietal cortex at age 3-20 years (2015)

Bryan Kolb. Overview of Factors influencing Brain Development. The Neurobiology of Brain and Behavior development . 2018

RESPONSE TO STRESS

- Increased production of cortisol by the brain
- Increased respiration, heart rate, blood pressure, attention, memory for threat, & energy for availability
- Defer need to eat, sleep
- Immune system functioning & tissue repair is slowed down
- Physical growth is delayed
- Exploration/play is halted

RESPONSE TO STRESS

- **FIGHT** – dysregulated, aggressive attempts to manage
- **FLIGHT** – withdrawn, shut down
- **FREEZE** – dissociated
- **'TEND and BEFRIEND'** – clingy, caretaking

WHEN STRESS BECOMES TRAUMA

Intensity of frightening events becomes unmanageable to the point of threatening physical and psychological integrity

TRAUMA

Events that are **perceived** as threatening the life/physical integrity of the child or someone important to the child

TRAUMA

- Overwhelming sense of terror, helplessness, & horror
- Intense physical effects: palpitation, rapid breathing, trembling
- Completely overwhelming the child's available coping strategies

TRAUMATIC EVENTS

- Direct abuse (physical abuse, sexual abuse)
- Neglect
- Domestic violence
- Witnessing violence
- Separation from important people
- Complex trauma

Liebmann & Van Horn, 2008

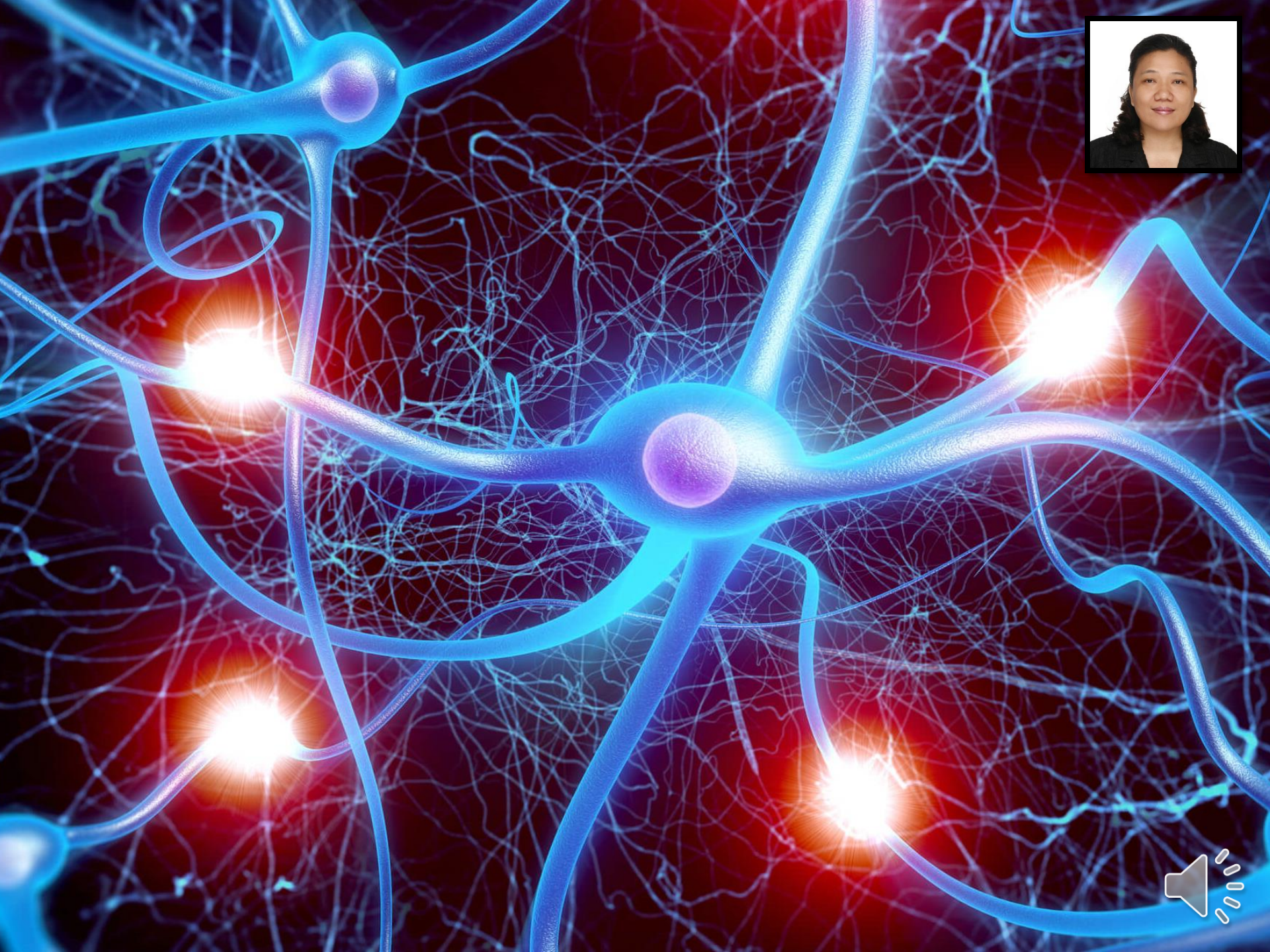
CHILD DEVELOPMENT AND NEUROBIOLOGY OF TRAUMA

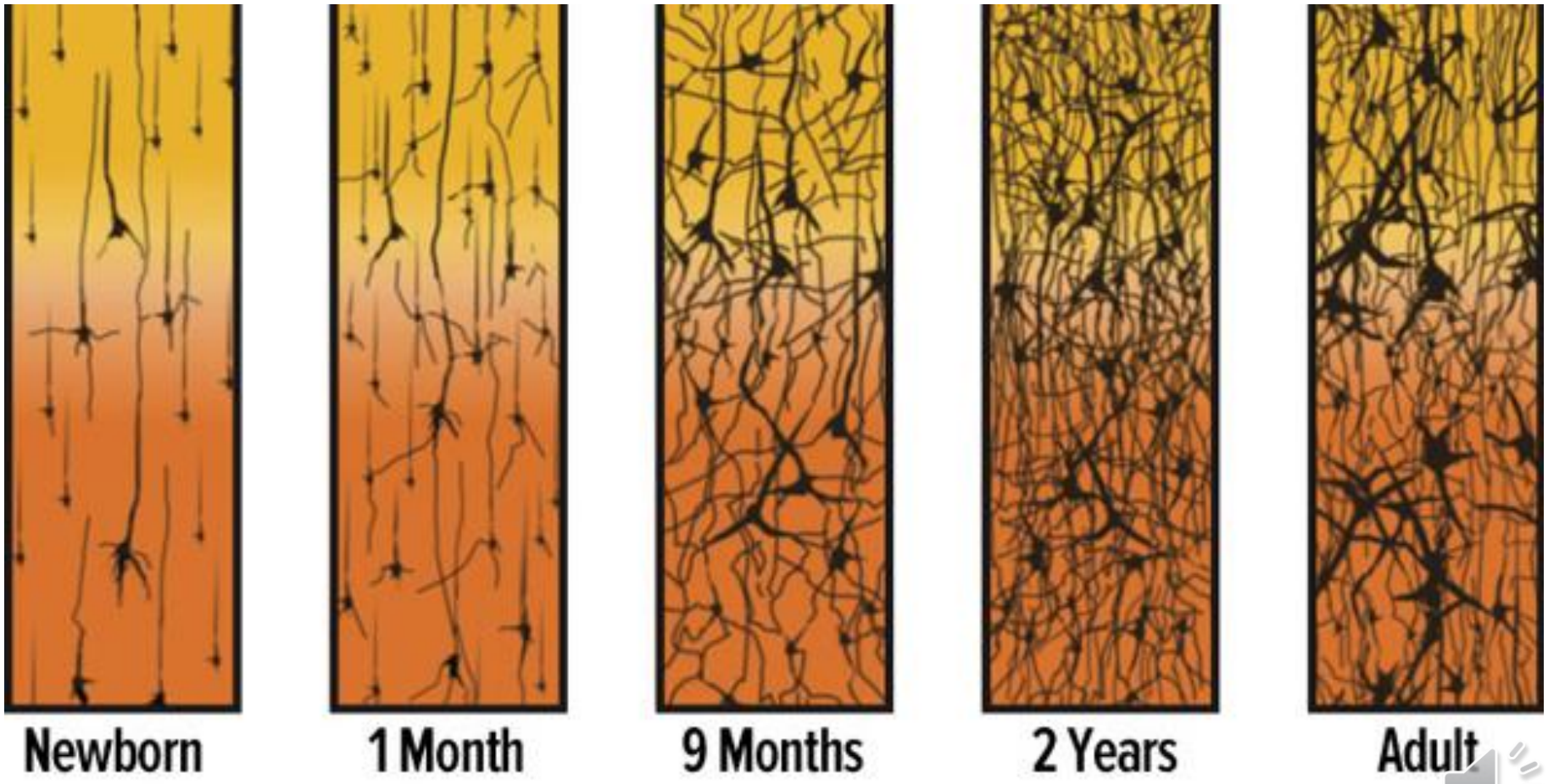
CHILD DEVELOPMENT

4 Main Areas of Development

1. Motor Development (Fine & Gross)
2. Cognitive Development
3. Social and Emotional Development
4. Speech and Language Development

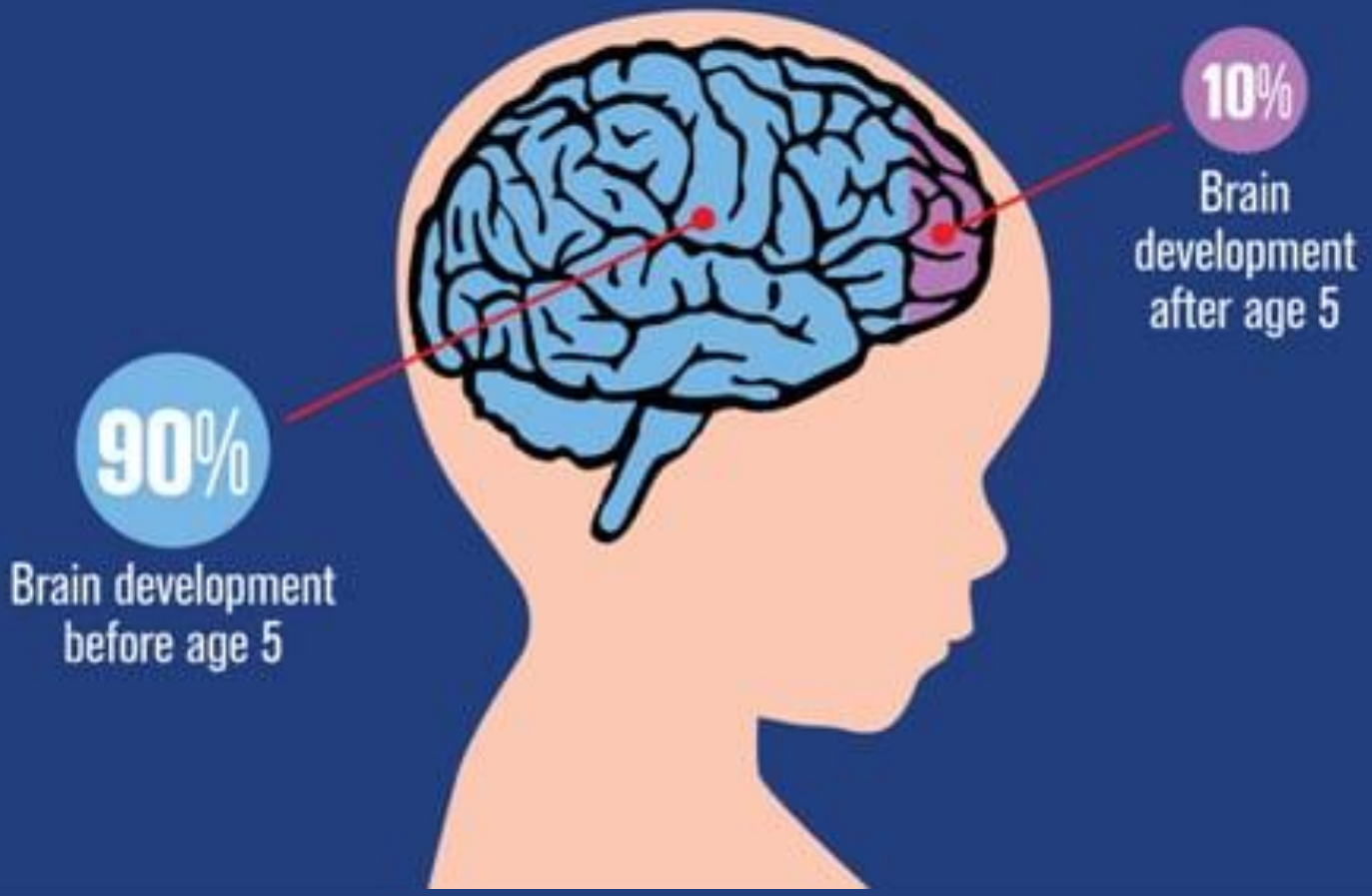
Child development
is *directed by* **brain development.**

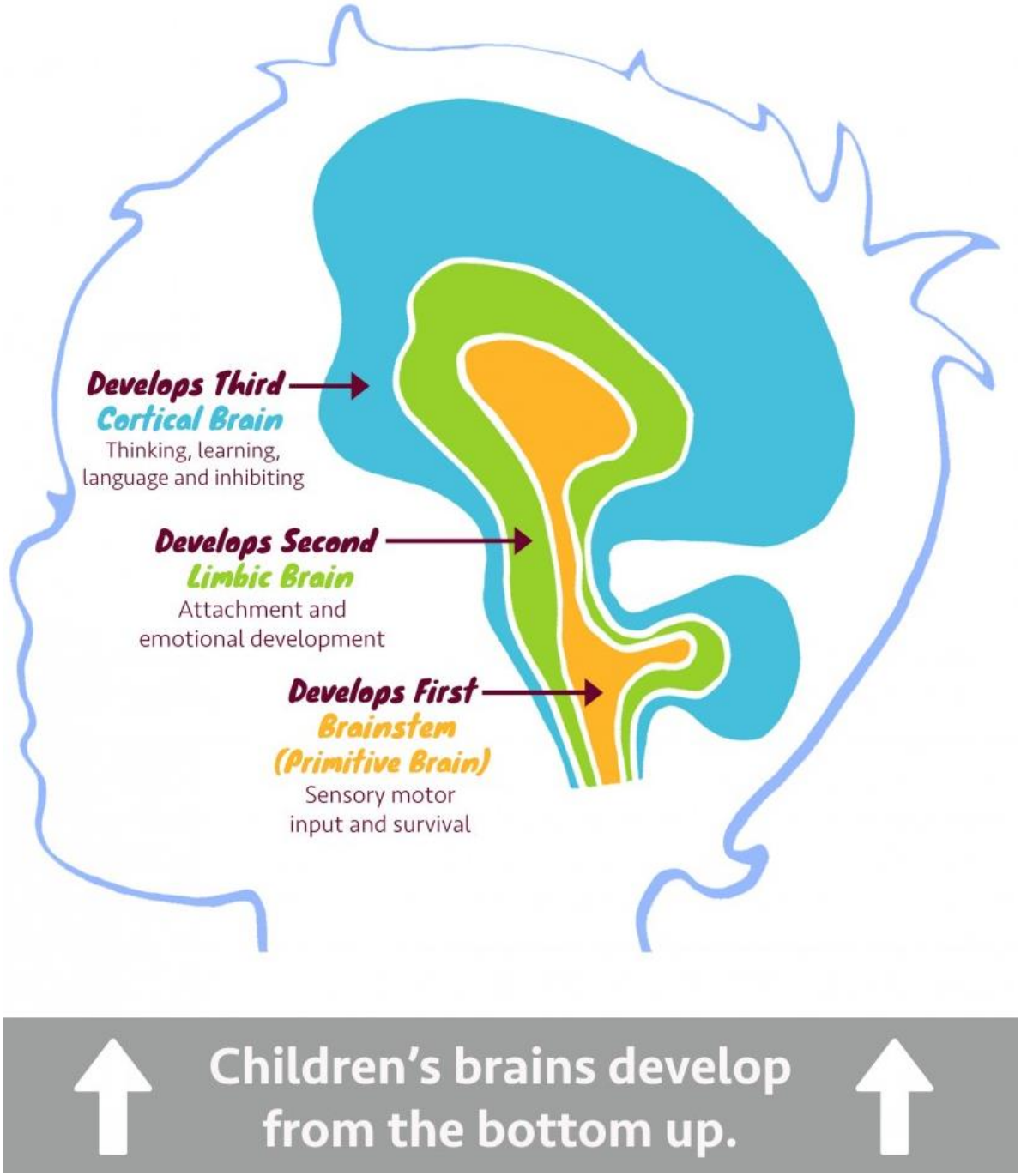



Newborn
1 Month
9 Months
2 Years
Adult

Before age 5

90% of a child's brain development happens





Children's brains develop from the bottom up.

Photo credit: Beacon House

CHILD DEVELOPMENT: PRINCIPLES

No two children are alike. Each one is different. Each child is a growing, changing person.

CHILD DEVELOPMENT: PRINCIPLES

Children cannot be made to grow. On the other hand, they cannot be stopped from growing.

CHILD DEVELOPMENT: PRINCIPLES

Most children roughly follow a similar sequence of growth and development.

- No two children will grow through the sequence in exactly the same way.
- Children will also grow faster or slower in different areas of development.

CHILD DEVELOPMENT: PRINCIPLES

Children are not small adults.

CHILD DEVELOPMENT: PRINCIPLES

- Growth is continuous, but is not always steady and does not always go smoothly ahead. You can expect to slip back or regress occasionally.
- Behavior is influenced by needs.

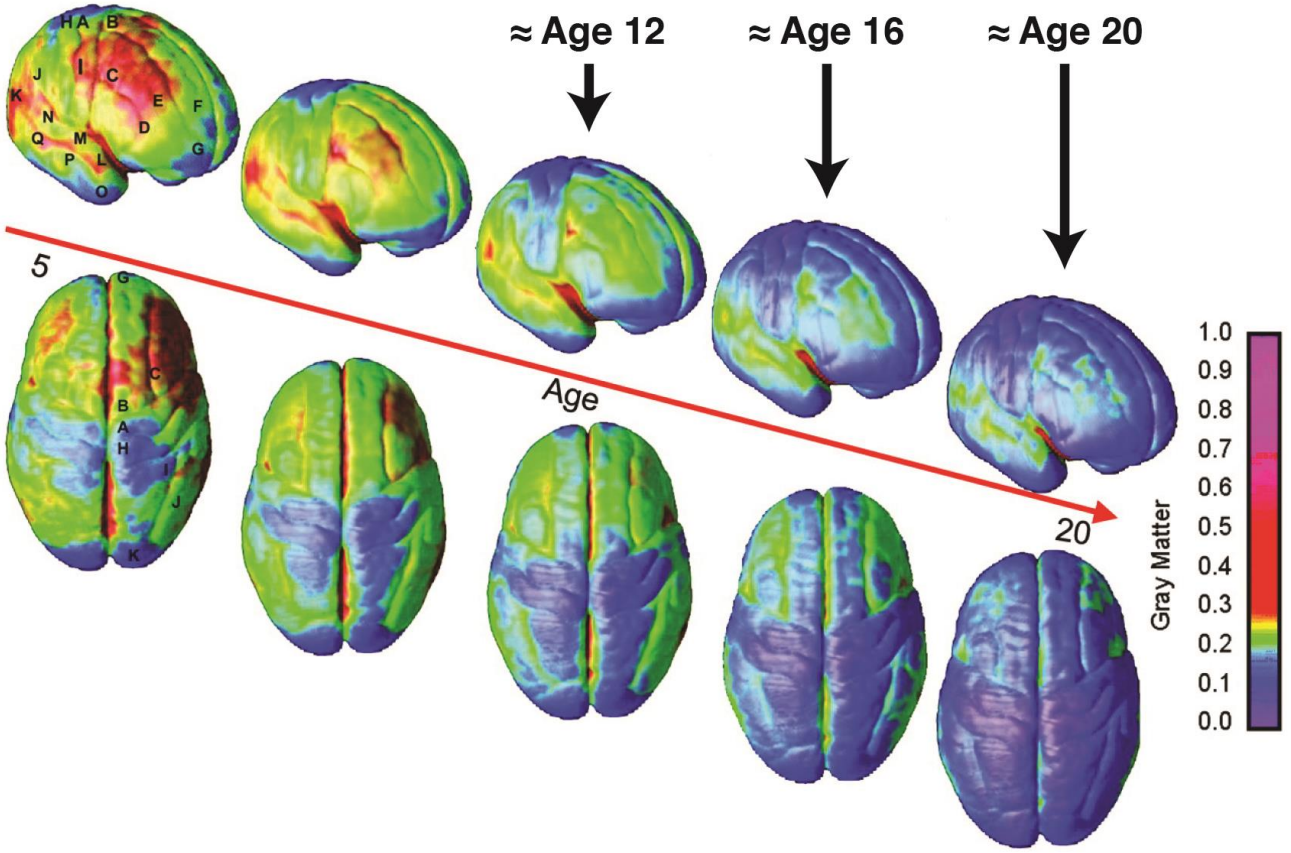
CHILD DEVELOPMENT: PRINCIPLES

- Children need to feel that they are loved, that they belong, that they are wanted.
- They also need the self-confidence that comes from being able to meet situations adequately.

CHILD DEVELOPMENT: PRINCIPLES

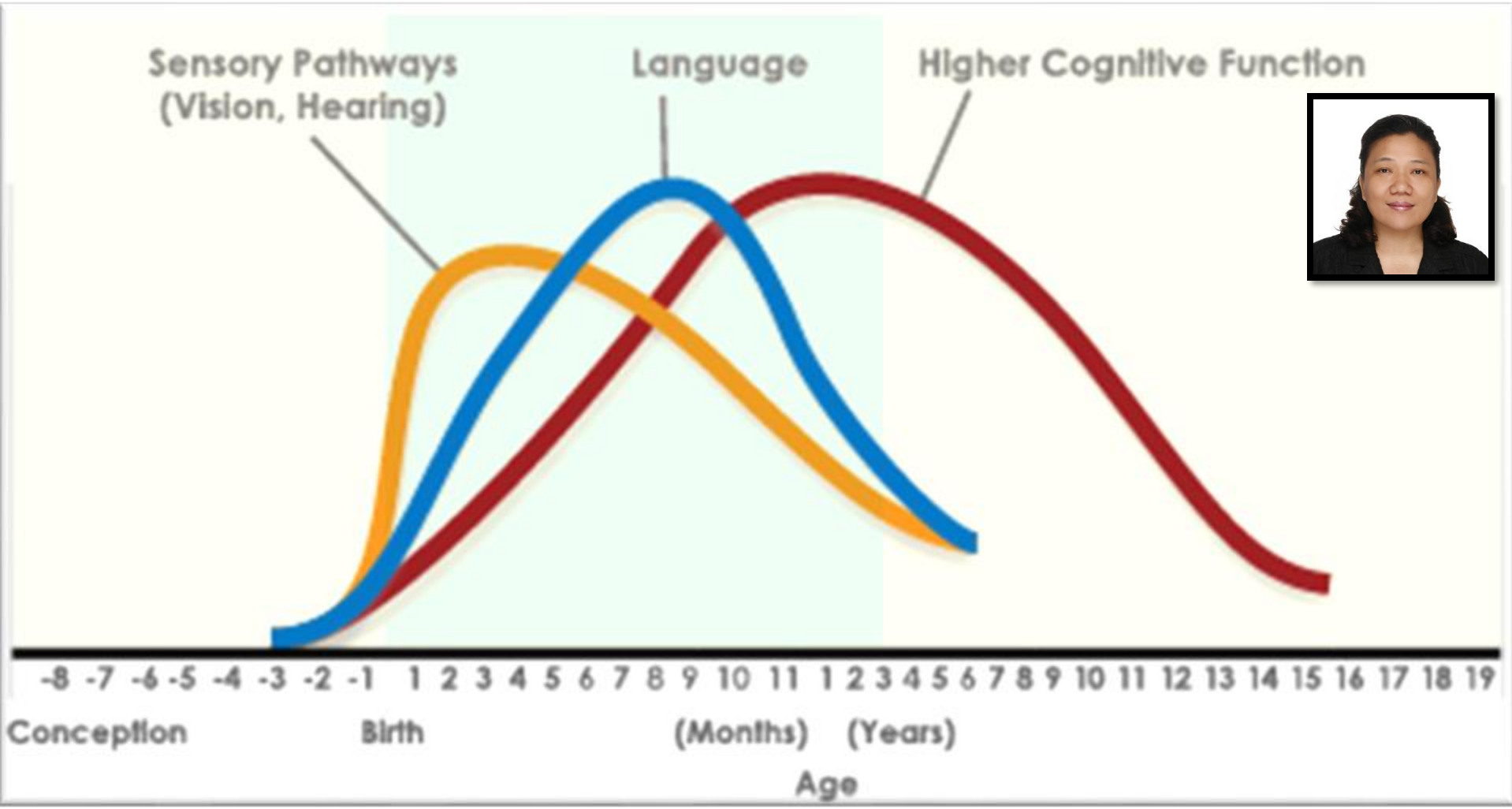
- It is important that experiences that are offered to children fit their own maturity level.

MRI Study of Normal Brain Development



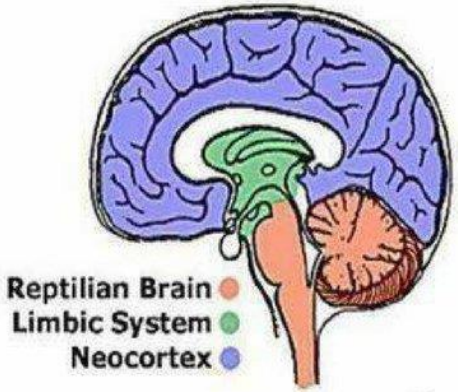
The decade-long magnetic resonance imaging (MRI) study of normal brain development, from ages 5 to 20, by researchers at NIH's National Institute of Mental Health (NIMH) and University of California Los Angeles (UCLA) Source: Paul M. Thompson, Ph.D., Laboratory of Neuro Imaging, UCLA, NIMH/UCLA Project. Reprinted with permission from Dr. Paul Thompson.

HUMAN BRAIN DEVELOPMENT
SYNAPSE FORMATION DEPENDENT ON EARLY EXPERIENCE

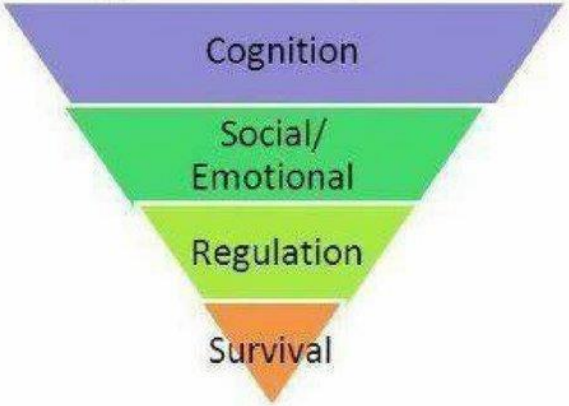


Nelson, C.A., in *Neurons to Neighborhoods (2000).* Shonkoff, J and Phillipe, D. (Eds)

Trauma & Brain Development



Typical Development

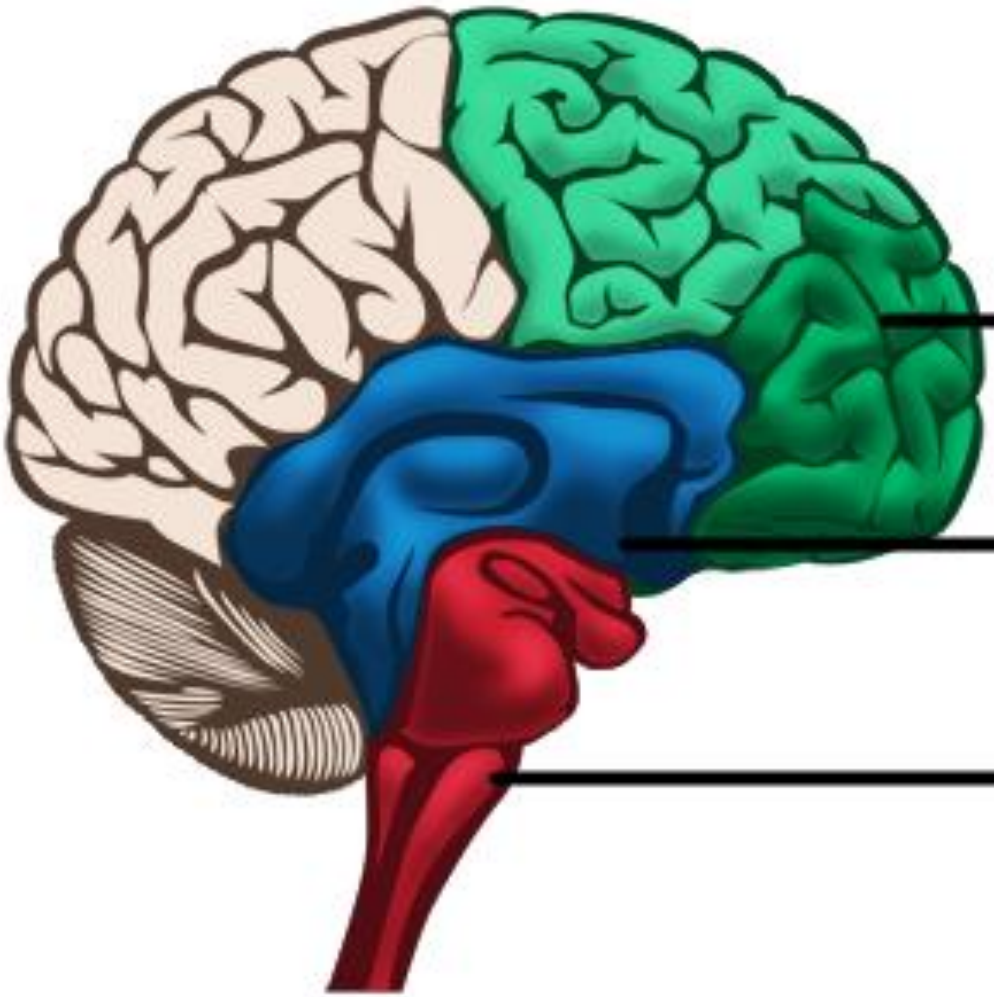


Developmental Trauma

Adapted from Holt & Jordan, Ohio Dept. of Education

Pediatric Connections Occupational Therapy Services, P.A.

www.pediatricconnectionsot.com

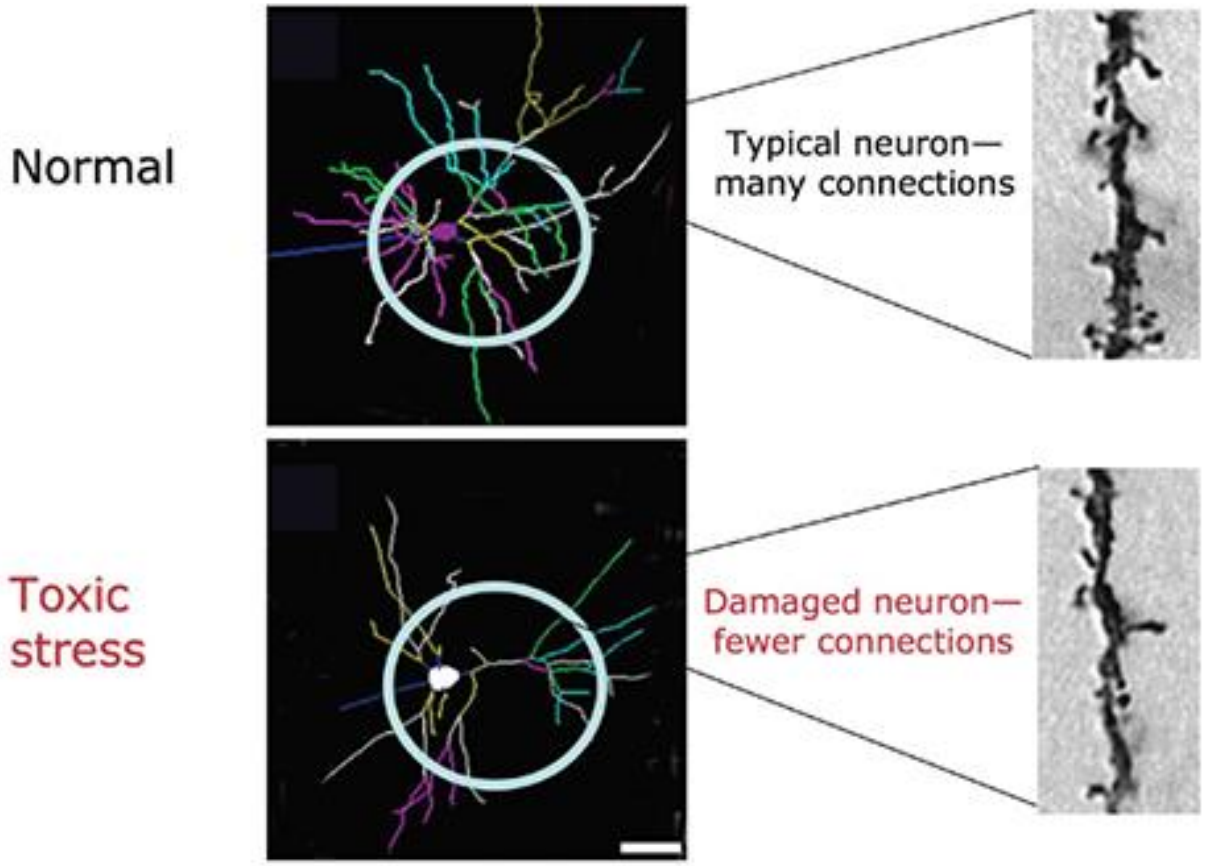


Executive State
Prefrontal Lobes
What can I learn from this?

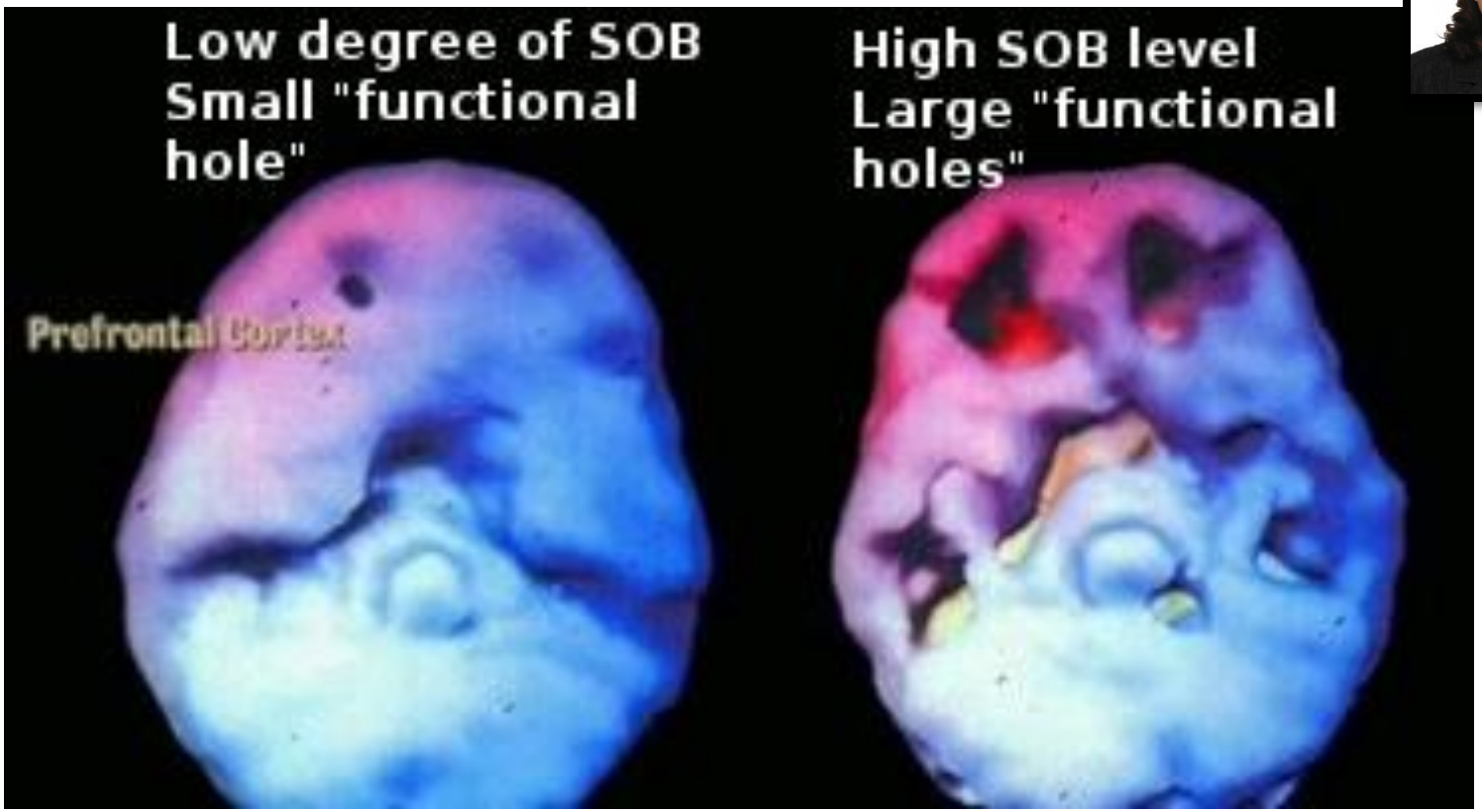
Emotional State
Limbic System
Am I loved?

Survival State
Brain Stem
Am I safe?

Persistent Stress Changes Brain Architecture

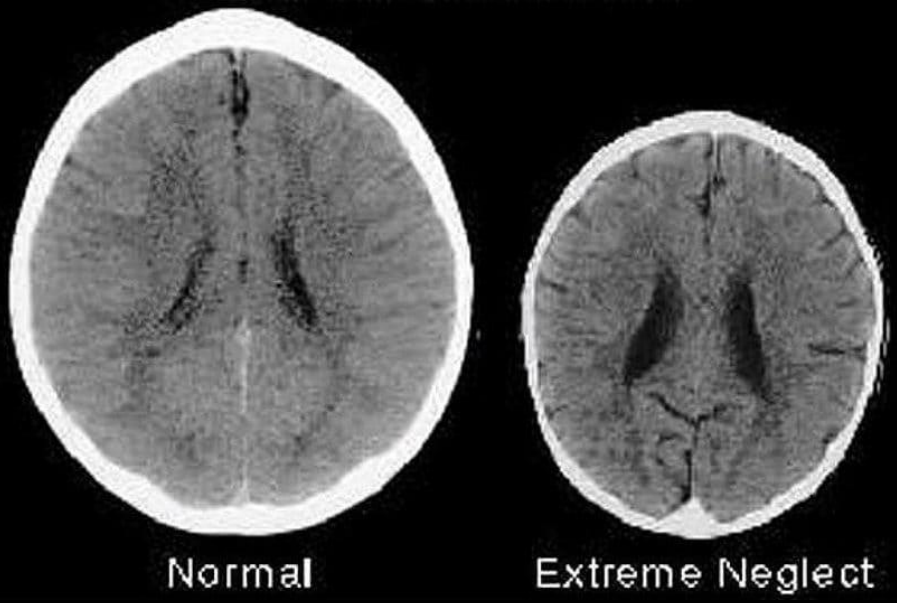


Prefrontal Cortex and
Hippocampus



PROLONGED EXPOSURE TO TOXIC STRESS/TRAUMA

➔ “survival” mechanisms of the brain and the body are more dominant than the “learning” mechanisms

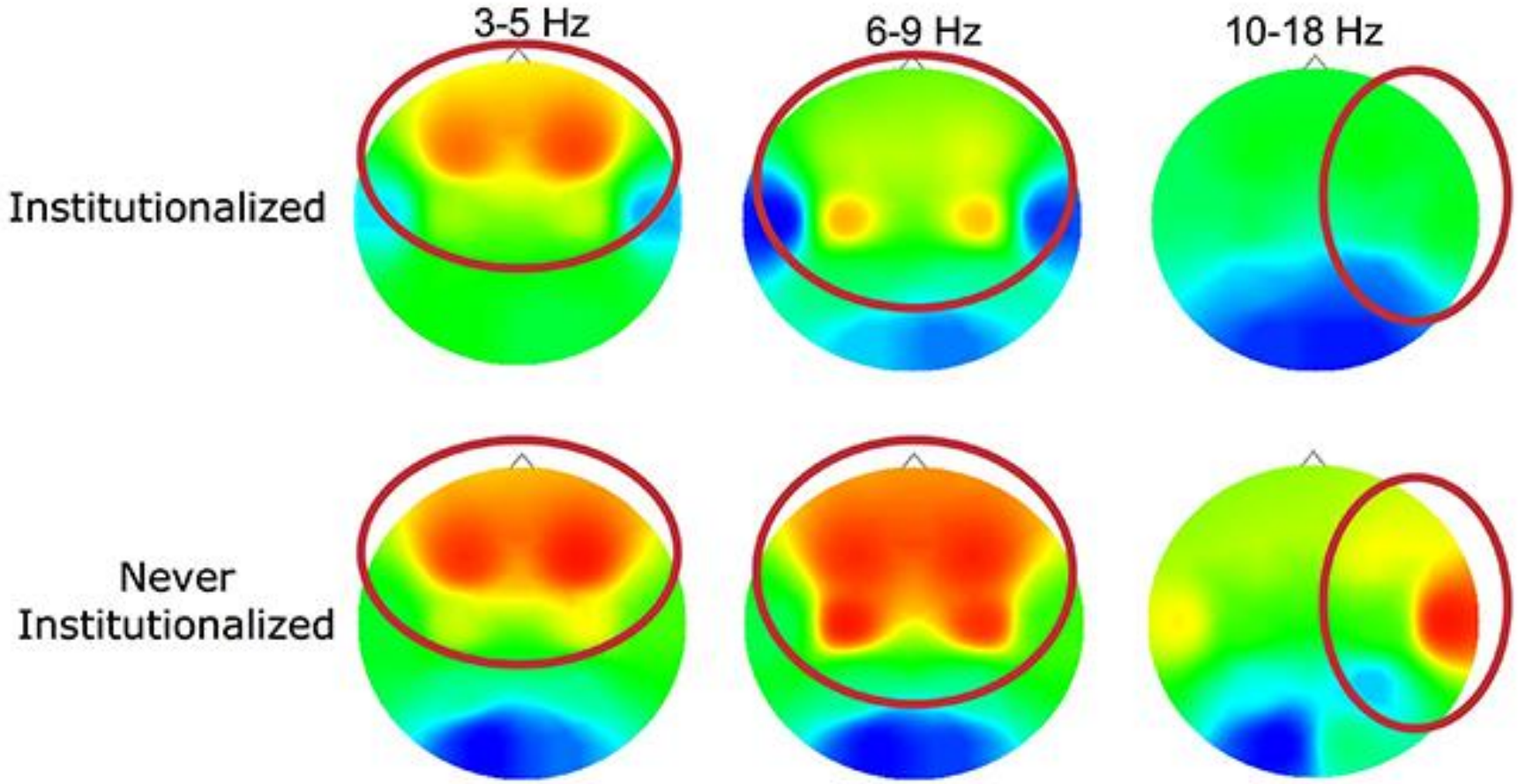


EFFECTS OF NEGLECT ON NEURODEVELOPMENT

- Smaller brains than normal children of the same age
- Developmental delays in language, fine and gross motor coordination
- Learning and attention problems

Putnam, F. the Impact of Trauma on Child Development. *Juvenile and Family Court Journal. Winter 2006*

Extreme Neglect Diminishes Brain Power



C.A. Nelson (2008); Marshall, Fox, & the BEIP Core Group (2004).

Photo source:
https://www.medicalnewstoday.com/articles/305880.php#causes

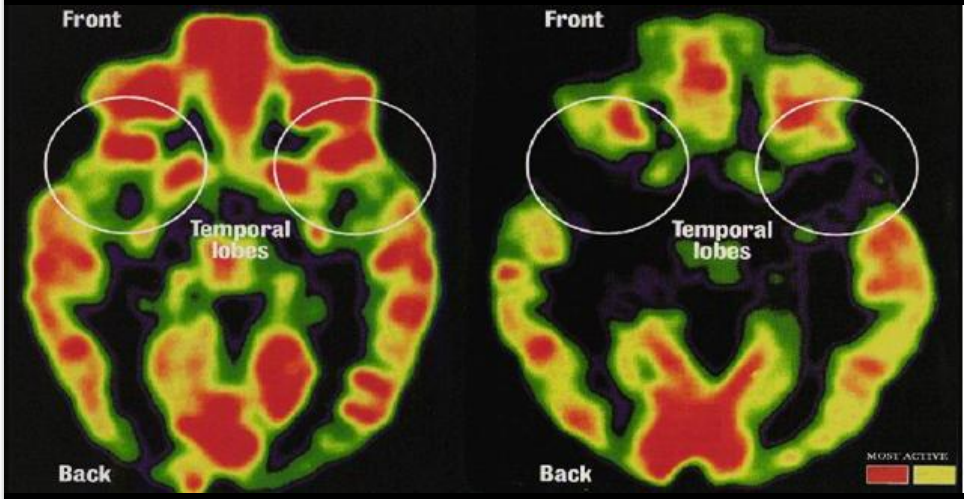
EFFECTS OF PHYSICAL AND SEXUAL ABUSE ON NEURODEVELOPMENT

- Smaller brain size
- The earlier the abuse, the longer the abuse, the greater effect on brain size

EFFECTS OF MALTREATEMENT ON NEURODEVELOPMENT

Maldevelopment of specific brain regions

- **Corpus callosum** – links the left & right sides of the brain
- **Frontal lobe areas** – planning, exercising judgment
- **Hippocampus** – memory
- Cognitive and language delay

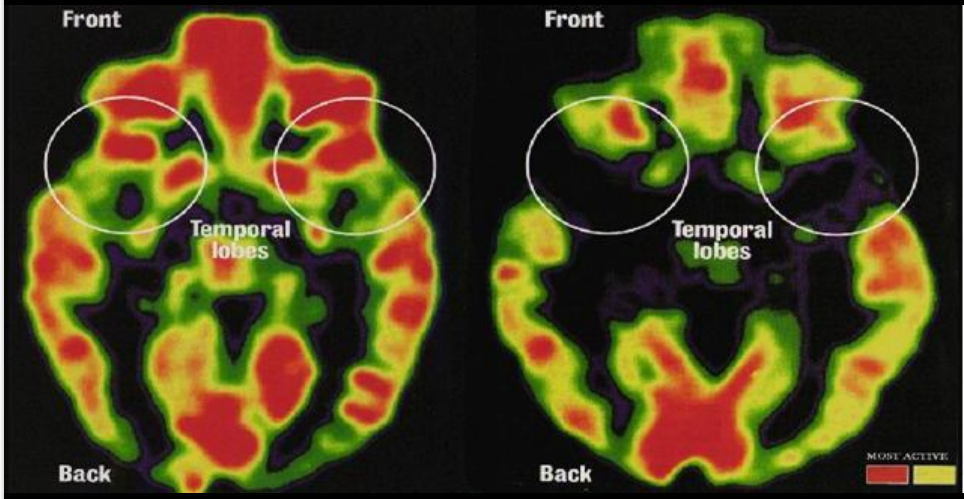


McLean S. The Effect of Trauma on the Brain Development of Children: Evidence-based principles for supporting the recovery of children in care. CFCA Practitioner Resource. June 2015

EFFECTS OF MALTREATEMENT ON NEURODEVELOPMENT

Maldevelopment of specific brain regions

- **Amygdala** – over-responsive to emotional stimuli
- **Ventro medial prefrontal complex** – problems in processing social information



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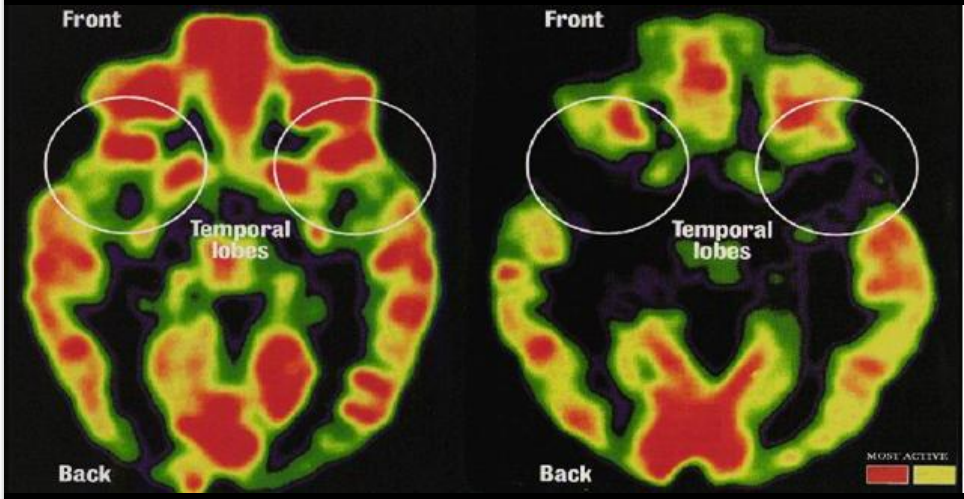
EFFECTS OF MALTREATEMENT ON NEURODEVELOPMENT

Maldevelopment of specific brain regions

- **Executive function difficulties** – attending to task, planning, organization, problem solving

- Poor ability to self-regulate and inhibit responses in emotionally neglected children



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PSYCHOLOGICAL CONSEQUENCES

Immediate emotional effects of abuse and neglect:

- Isolation, fear, and an inability to trust
- Low self-esteem, depression, and relationship difficulties

PSYCHOLOGICAL CONSEQUENCES

Cognitive difficulties

- Lower scores on measures of cognitive capacity, language development, academic achievement
- Poor academic performance and classroom functioning for school-age children

Social difficulties

- More likely to develop antisocial traits
- Parental neglect seen to be associated with borderline personality disorders and violent behavior

PSYCHOLOGICAL CONSEQUENCES

- Psychiatric disorder by age 21
- Depression
- Anxiety
- Eating disorders
- Reactive attachment disorder
- Dissociative disorders
- ADHD
- Anger
- PTSD
- Suicide attempts
- Panic Disorder

BEHAVIORAL CONSEQUENCES

Difficulties during adolescence

- Juvenile delinquency
- Sexual risk-taking, teen pregnancy, contracting STI
- Low academic achievement
- Use of alcohol, illicit drugs, smoke cigarettes
- Mental health problems

Difficulties during adulthood

- Criminality
- Abusive behavior

Mechanism by which Adverse Childhood Experience Influence Health and Well-being Throughout the Lifespan

Adverse Childhood Experiences (ACE) Categories

1. Contact sexual abuse
2. Recurrent psychological abuse
3. Recurrent physical abuse
4. Psychological neglect
5. Physical neglect
6. Alcohol/drug abuse in household
7. Incarcerated household member
8. Household mental illness
9. Mother treated violently
10. Parents divorced or separated

1 point for each type of trauma.

Add up all your points to get your ACE score.

Adverse Childhood Experiences Study

- Adverse Childhood Experiences (ACE) Study in Metro Manila looked at adverse childhood experiences, which include:
  - Physical abuse
  - Emotional abuse
  - Sexual abuse
  - Growing up in household with:
    - Alcohol or drug user
    - Member being imprisoned
    - Mentally ill, chronically depressed, or institutionalized member
    - Separation/Divorce
    - Mother being treated violently
    - Both biological parents absent
    - Emotional or physical abuse

Ramiro Madrid, & Brown,2010
(Fellitti,1998)

PHYSICAL CONSEQUENCES

Lifespan Impacts of ACEs

Critical & Sensitive Developmental Periods

Adverse Childhood Experience
MORE CATEGORIES – GREATER IMPACT
Physical Abuse, Sexual Abuse
Emotional Abuse, Neglect
Witnessing Domestic Violence
Depression/Mental Illness in Home
Incarcerated Family Member
Substance Abuse in Home
Loss of a Parent

Genetics
Experience triggers gene expression (Epigenetics)

Brain Development
Electrical, Chemical, Cellular Mass

Adaptation
Hard-Wired Into Biology

Chronic Disease

Psychiatric Disorders

Impaired Cognition

Work/School
Attendance, Behavior, Performance

Obesity

Alcohol, Tobacco, Drugs

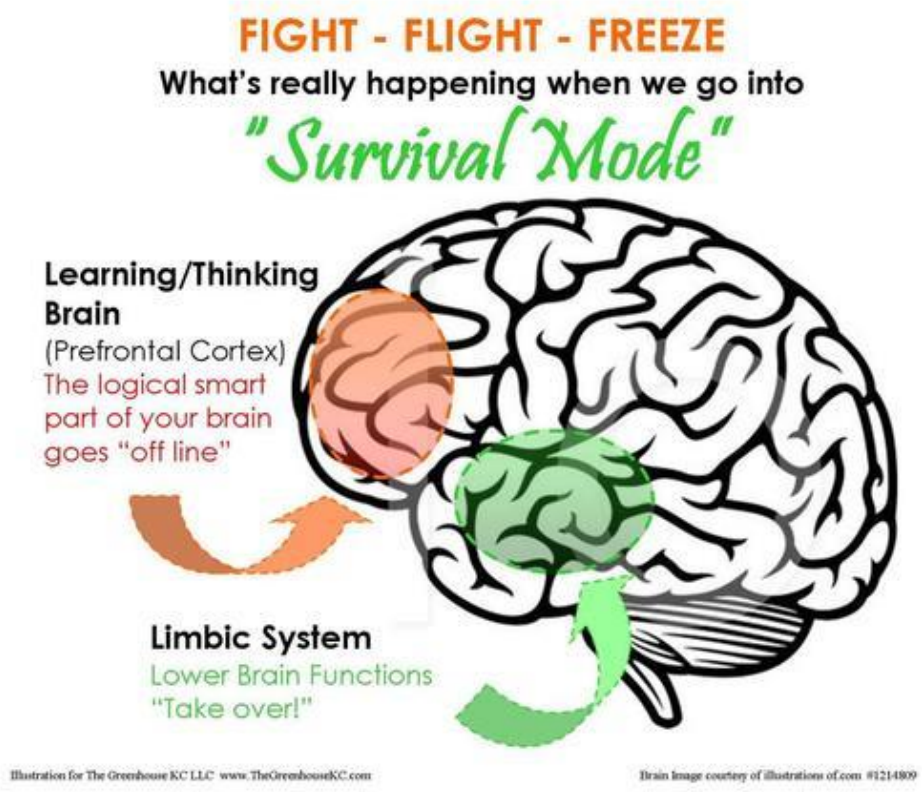
Risky Sex

Crime

Poverty

Intergenerational Transmission, Disparity

Source: Family Policy Council, 2012



SUMMARY

Severe, chronic abuse has an adverse impact on brain architecture

- Early, sensitive periods of brain development
  - Regions of the brain involved in fear, anxiety, impulsive responses may overproduce neural connections
  - Regions dedicated for reasoning, planning, behavioral control may produce fewer neural connections

SUMMARY

Severe, chronic abuse has an adverse impact on brain architecture

- Change the stress system
  - Responds at lower thresholds to events that might not be stressful to others
    - Stress response system activates more frequently and for longer periods than necessary
    - Wear and tear increases the risk of related physical and mental illness

SUMMARY

Sustained activation of the stress response

- Impairments in learning, memory, and the ability to regulate certain stress responses

SUMMARY

Children who grow up in conditions of economic hardship exhibit elevated stress hormone levels.

MESSAGE

Child's (brain) development will impact your interview

Thank you!