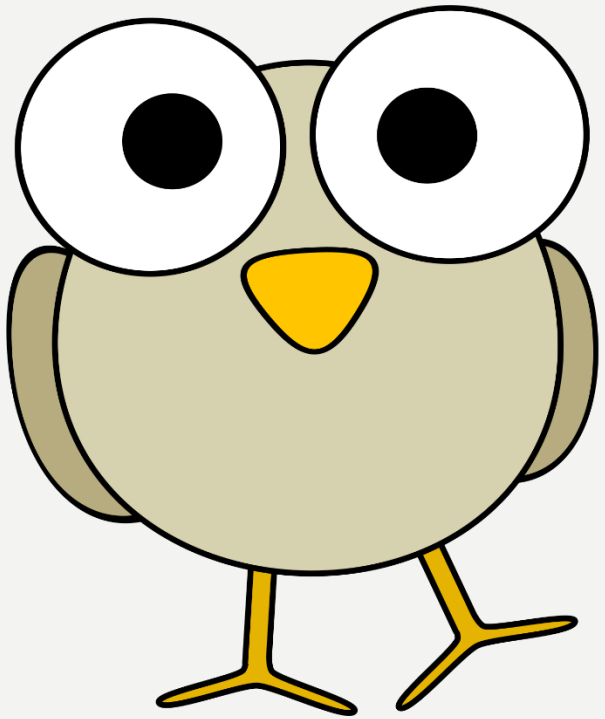
CHILDREN AND TRAUMA: ADVERSE CHILDHOOD EXPERIENCES

DEANNA ST. GERMAIN, DO
MEDICAL DIRECTOR
KIDS' FIRST CENTER

OBJECTIVES

- Review the effects of early maltreatment on the developing brain.
- Review the potential behavioral manifestations of early maltreatment.
- Review the health outcomes associated with Adverse Childhood Experiences.

WHY AM I HERE?



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WHAT DO I WANT YOU TO REMEMBER?

Children need to be cared for, from conception to young adulthood.

CHILDHOOD TRAUMA

ACE's

POOR Health
POOR relationships
Criminality

Behaviors:
substances, sex, food.
MH disorders:
depression, anxiety, rage.
End organ changes.

Areas of the brain and neuro-endocrine system over-stimulated for fear/aggression
And under-stimulated for empathy/relationships/learning

THE SCIENCE OF EARLY CHILDHOOD DEVELOPMENT

- "Toxic stress in early childhood is associated with persistent effects on the nervous system and stress hormone systems that can damage developing brain architecture and lead to lifelong problems in learning, behavior, and both physical and mental health."

National Scientific Council, Center on the Developing Child at Harvard University

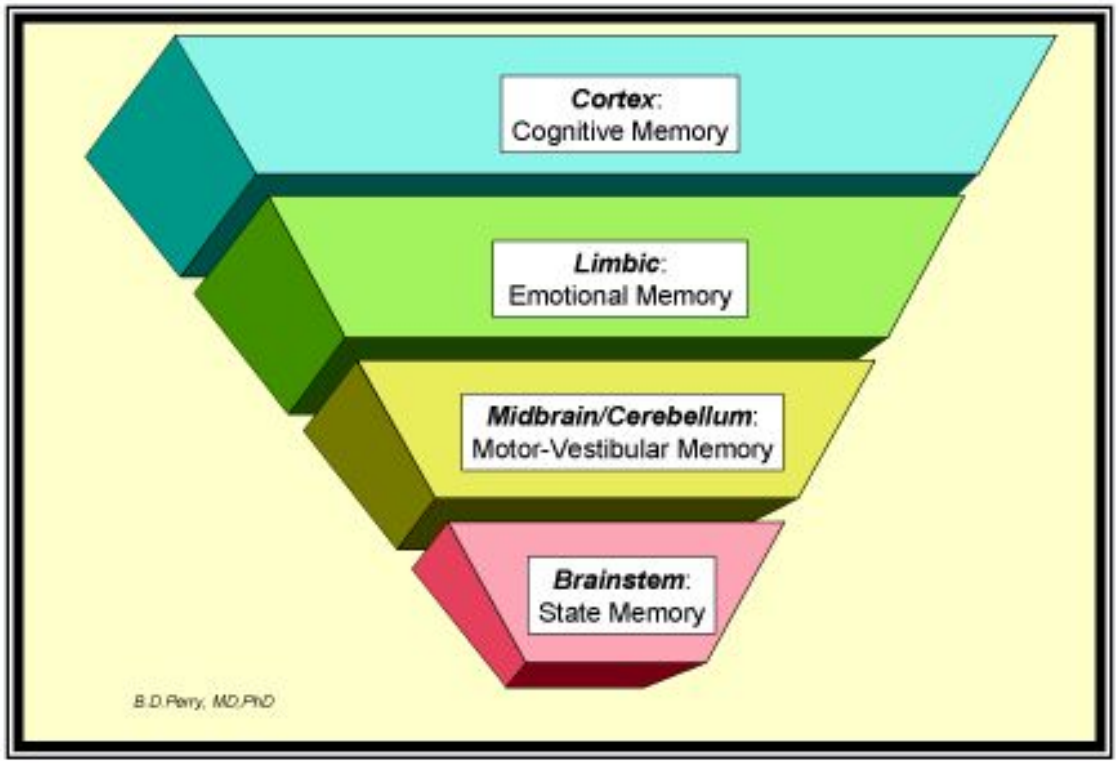
IMPORTANT!

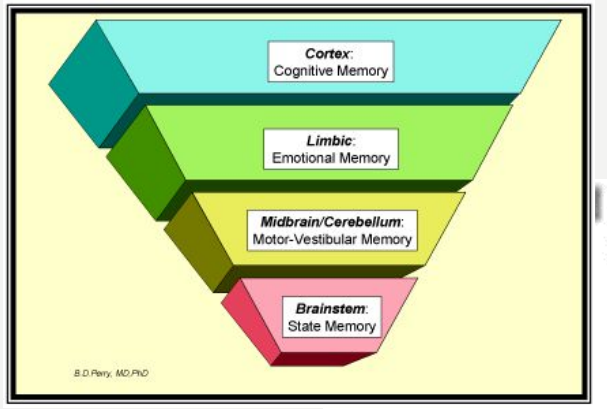
- Some children will be **resilient**.
  - Capacity for cognitive functioning
  - Capacity for emotional regulation
  - Presence of social supports provided by caring and competent adults
  - Holding a positive belief about oneself
  - Belief in the safety and fairness of one's situation
  - Motivation to act effectively in one's environment
    - National Child Traumatic Stress Network 2008

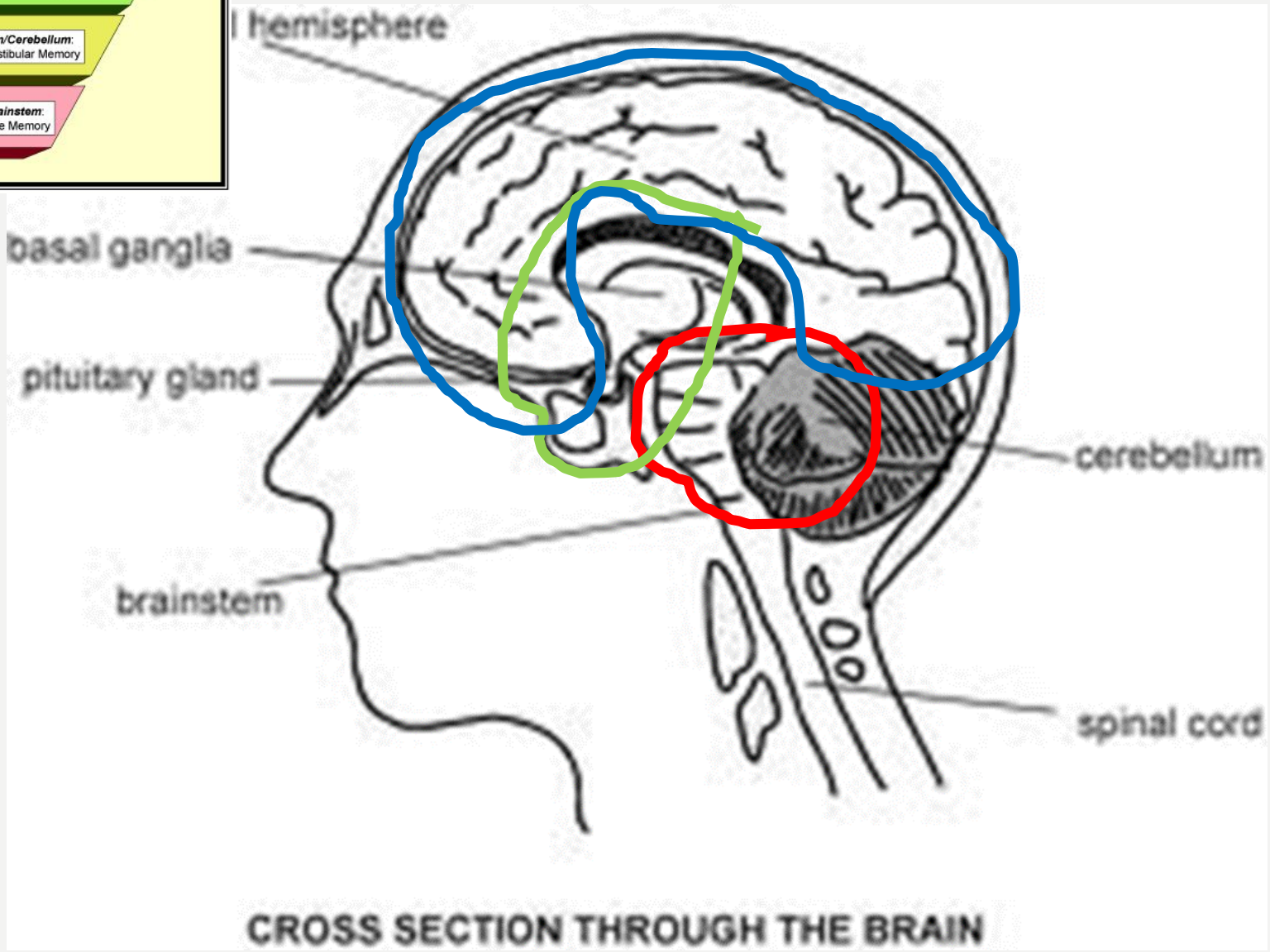
- **Trauma effects are not a 100% correlation but the risks are high.**

OUR YOUNG BRAIN

- FIRST BRAIN SURGE:
  - Most of the brain's growth occurs within the first 2-3 yrs of life.
  - 100 million to 100 billion neurons with tens of thousands of connections to other neurons.




Cortex:
Cognitive Memory
Limbic:
Emotional Memory
Midbrain/Cerebellum:
Motor-Vestibular Memory
Brainstem:
State Memory
B.D.Perry, MD,PhD


l hemisphere
basal ganglia
pituitary gland
cerebellum
brainstem
spinal cord
CROSS SECTION THROUGH THE BRAIN

EARLY BRAIN DEVELOPMENT

- Malnutrition, both prenatal and postnatal:
- Maternal stress:
- Teratogens:
  - Alcohol

- Can lead to decreased brain growth and slowing of electrical signals.
  - Nelson et al. 2006.

MARIJUANA

- Cannabinoid receptors act on fetal brain development directly affecting neurons, key genes for neural development as well as molecules affecting appetite and weight regulation. THC exposure during key periods of brain development can create "subtle and long-lasting neurofunctional alterations…potentially leading to long-lasting alterations in cognitive functions and emotional behaviors"
  - Breastfeeding Medicine(2015)10:3, 135-141.

EARLY BRAIN DEVELOPMENT

- Neurons are not hard-wired.
- Brain development is an ongoing process.
- The more activity between neuronal connections…the stronger the connections become.
- "experiences can change the function of our brains, and even alter its structure"
    - Stien & Kendall, 2003.

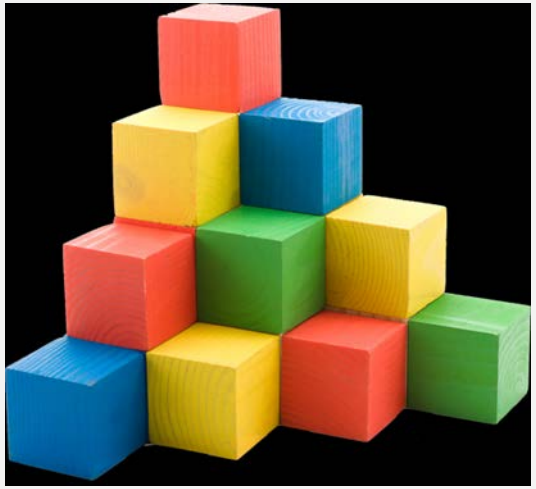
BRUCE PERRY, PHD MD

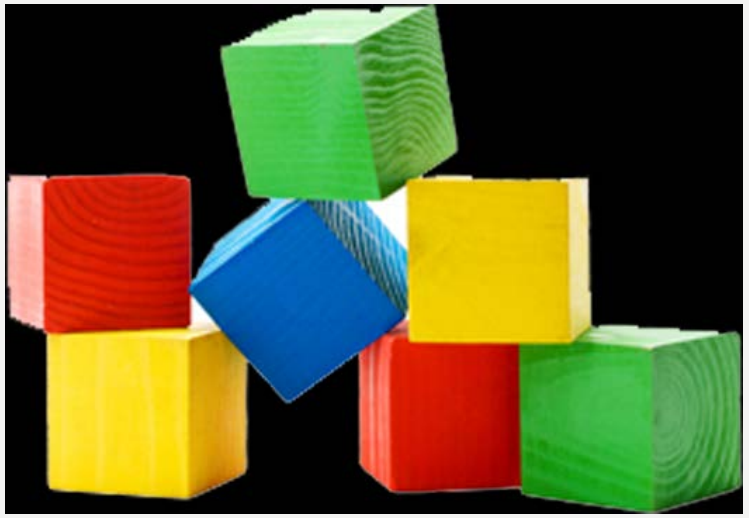
- "We don't know that well how the brain works, but we know it develops as a mirror to what it's exposed to. It takes what's on the outside and puts it on the inside. If on the outside you have nurturance, structure, predictability, children can build good things inside themselves."

- In "Child Abuse on the Brain" by Steve Bogira, 1992 (Chicago Reader)

EARLY BRAIN DEVELOPMENT

- Lack of stimulation = no neuronal pathways develop.
- Over years the ability to create those pathways may be lost.
  - Attachment
    - Ability to be comforted and later to parent
  - Relationships
    - Empathy
    - Compassion.

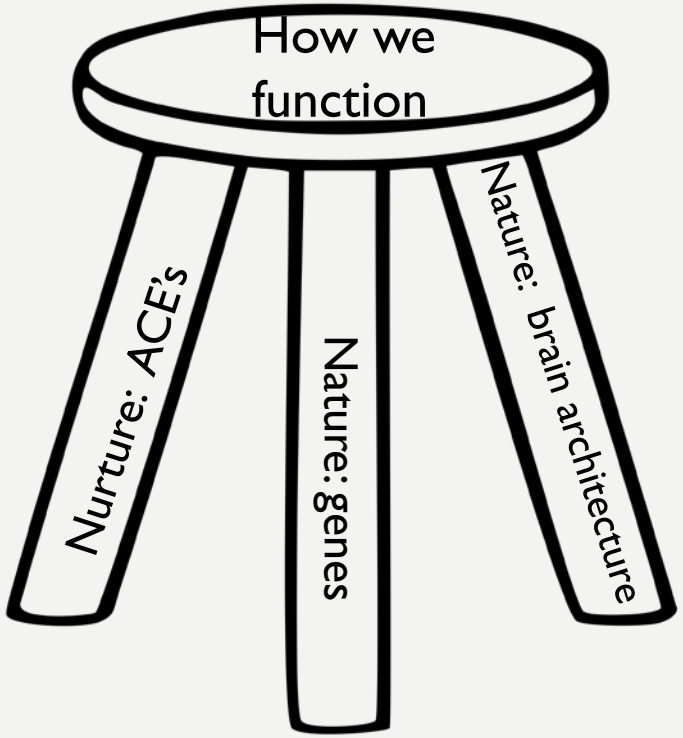




NEXT BRAIN SURGE

- After first few years of life…
- Ages 11-26 is a time of "exuberant connection" back to front and inside to outside
  - Voice tone and facial expressions = greatest impact, NOT words.
  - Last area online is prefrontal cortex, age 26.
    - Planning
    - Decision making (cost/benefit ratio)
    - Learning
    - The ability to coordinate thoughts or actions in relation to internal goals.

WHO ARE WE?



Fallon, 2013 "The Psychopath Within"

Nature

- Brain architecture

For psychopathy: unusually low functioning of the orbital prefrontal cortex and anterior temporal lobe included amygdala

- Genetic make-up (turned on/off)

High risk variants of several genes (warrior gene)

Protective genes

Nurture

- Adverse childhood experiences of trauma and neglect

WHY IS NURTURE SO IMPORTANT?

Bruce Perry, MD Child Trauma Academy (childtrauma.org)

6 CORE STRENGTHS

- 1. **Attachment**-making relationships
- 2. **Self-regulation**-containing impulses
- 3. **Affiliation**-being part of a group
- 4. **Attunement**-being aware of others
- 5. **Tolerance**-accepting others
- 6. **Respect**-finding value in differences

- The ChildTrauma Academy


National Children's Advocacy Center
Click Here to Finish Webinar!
What is Trauma?
The experience of a real or perceived threat to life or bodily integrity.
OR
The life or bodily integrity of a loved one
AND
Causes an overwhelming sense of terror, horror, helplessness, and fear.

TWO ESSENTIAL NEEDS OF HUMANS

- SAFETY
- VALUE
  - Rejection registers in the same part of the brain as physical pain/threat.

ETIOLOGY

Figure 4: Spectrum of stress

STRESS

- Mild, predictable stress is good and influences the brain's ability to respond and adapt.
- No stress is not good for children either.

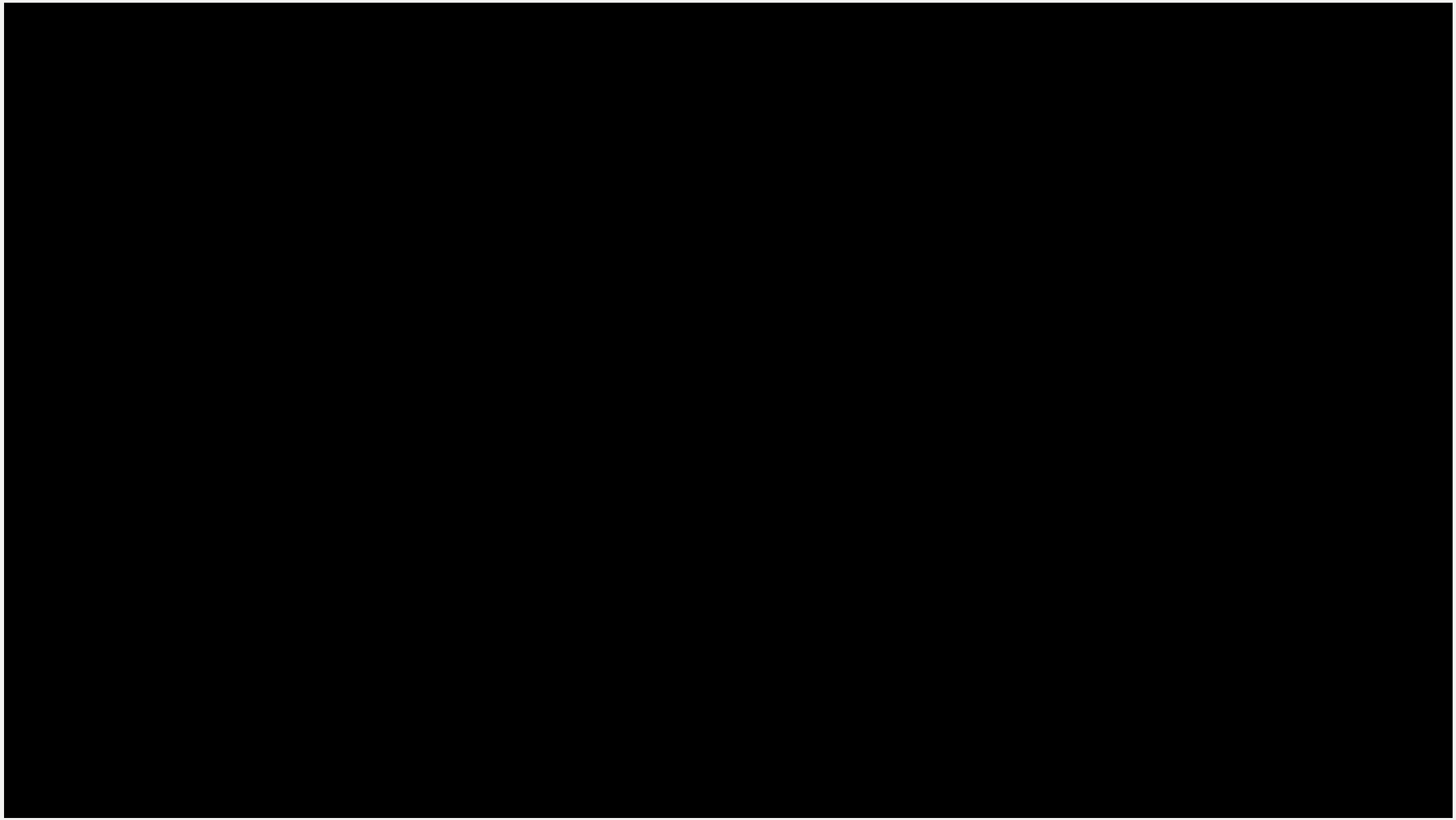
STRESS

- Brain responds to chronic, low grade stress the same way as acute trauma.
  - Both disrupt circuitry involved in learning and increase arousal.

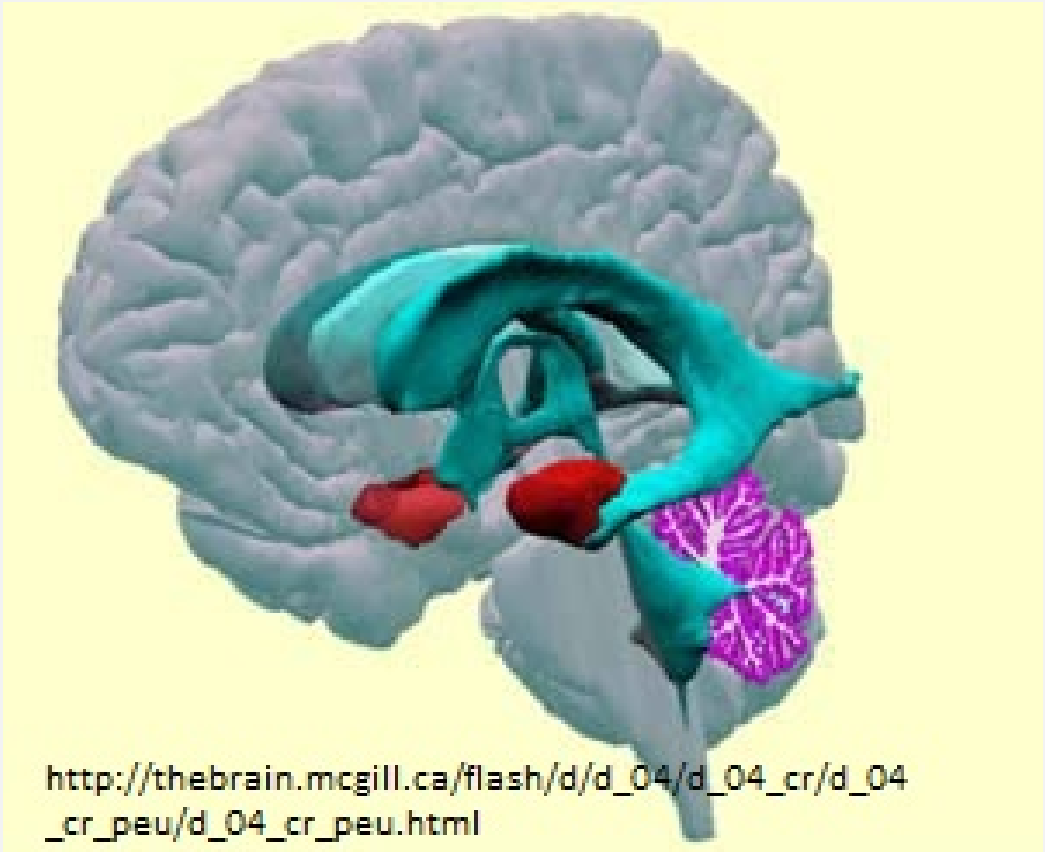
STRESS

- In maltreatment, stress is prolonged and unpredictable and sometimes severe. The developing brain is particularly sensitive to this
  - Overdevelops certain areas of the brain
    - Behavioral impulsivity
    - Cognitive distortions
  - Underdevelops other areas.
    - Cognitive growth, emotional stability and socialization.
      - Perry et al. **Infant Mental Health Journal.** 1995.
- Chronic unpredictable stress is worse than predictable but more traumatic stress.
  - "Childhood Disrupted" 2015 by D Jackson Nakazawa

Bruce Perry, MD Child Trauma Academy



EVEN MORE DETAIL: THE AMYGDALA



http://thebrain.mcgill.ca/flash/d/d_04/d_04_cr/d_04_cr_peu/d_04_cr_peu.html

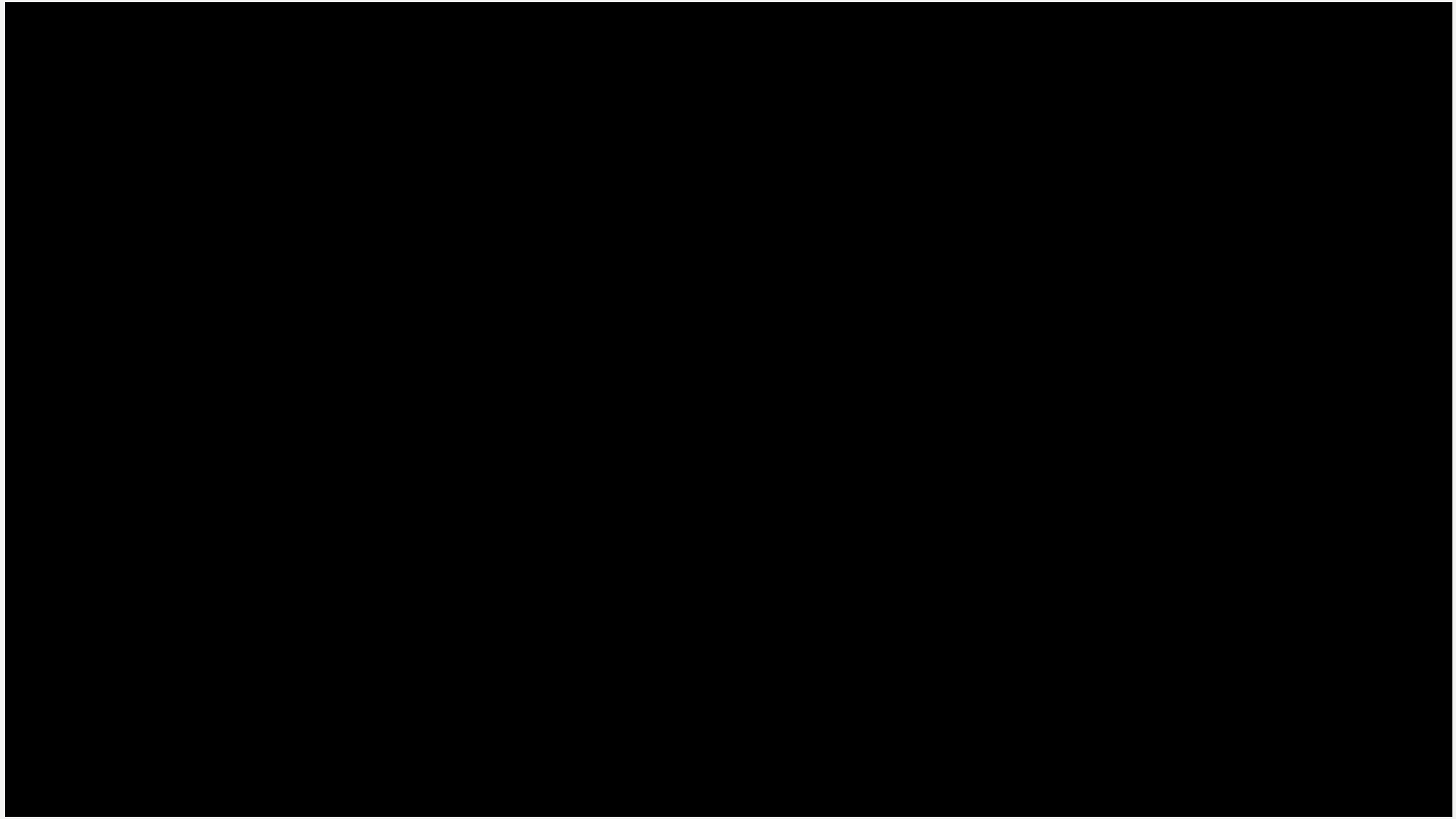
THE LOW ROAD…

- Amygdala hijack
  - Saber tooth tiger attack = ego attack
  - No connection to prefrontal cortex or the "thinking brain" just reaction and reflexive primitive brain.
    - This reaction lasts 18 minutes and stress hormones are released that stay in your body for 3-4 hours.
    - We will default to habituated behavior

- THINK ROAD RAGE

THE HIGH ROAD…

- Amygdala clicked forward
  - Online with prefrontal cortex
    - Able to be creative, imaginative with multiple possibilities as response.
    - No stress hormones released.



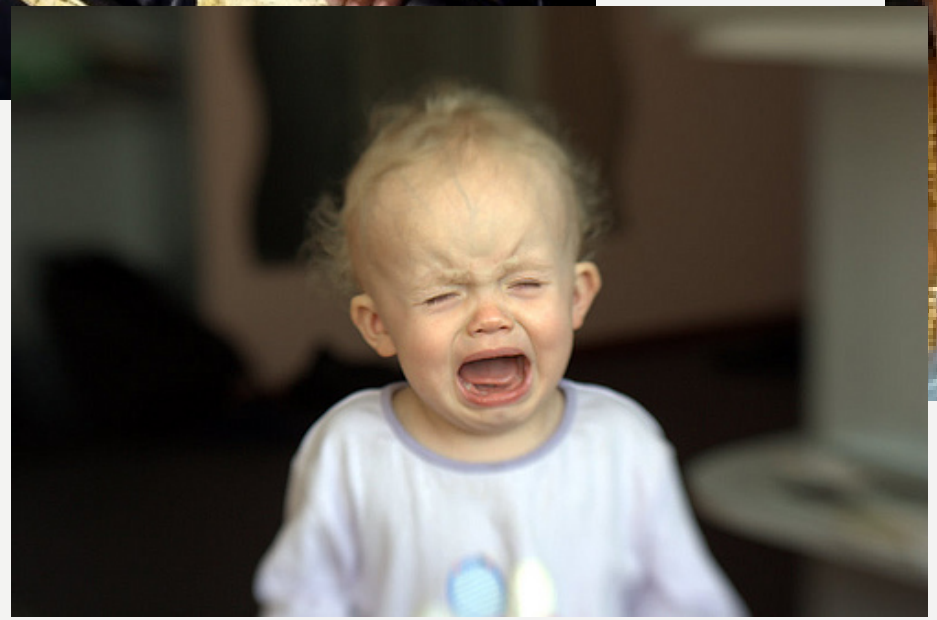
THE CASE FOR NURTURE
1945 STUDY: ORPHANAGE VS PRISON NURSERY

- Orphanage- one nurse for 8 babies who laid in their crib day after day with little interaction to decrease contagions.
- Prison- babies spent most of the their days with their incarcerated mothers.

- RESULTS:
  - 37% of orphanage babies were dead before the age of 2 years.
  - 0% of prison babies died.
  - Prison children did better in every way measured.

- Szalavitz and Perry, 2010. "Born For Love"

WHAT DO TRAUMATIZED CHILDREN LOOK LIKE?



NCTSN The National Child Traumatic Stress Network

Table 1. Child Traumatic Stress Reactions (By Age Group)

Age Group	Common Traumatic Stress Reactions
Young children (Birth–5 y)	▪ Withdrawal and passivity ▪ Exaggerated startle response ▪ Aggressive outbursts ▪ Sleep difficulties (including night terrors) ▪ Separation anxiety ▪ Fear of new situations ▪ Difficulty assessing threats and finding protection (especially in cases where a parent or caretaker was aggressor) ▪ Regression to previous behaviors (e.g., baby talk, bed-wetting, crying)
School-age children (6–12 y)	▪ Abrupt and unpredictable shifts between withdrawn and aggressive behaviors ▪ Social isolation and withdrawal (may be an attempt to avoid further trauma or reminders of past trauma) ▪ Sleep disturbances that interfere with daytime concentration and attention ▪ Preoccupation with the traumatic experience(s) ▪ Intense, specific fears related to the traumatic event(s)
Adolescents (13–18 y)	▪ Increased risk taking (substance abuse, truancy, risky sexual behaviors) ▪ Heightened sensitivity to perceived threats (may respond to seemingly neutral stimuli with aggression or hostility) ▪ Social isolation (belief that they are unique and alone in their pain) ▪ Withdrawal and emotional numbing ▪ Low self esteem (may manifest as a sense of helplessness or hopelessness)

This project was funded by the Substance Abuse and Mental Health Services Administration, US Department of Health and Human Services.

THESE CHILDREN ARE MISDIAGNOSED

- They are suffering the effects of trauma but are diagnosed as:
  - ADD/ADHD
  - Oppositional deviant
  - Schizophrenia
  - Psychosis
  - Bipolar

- Bruce Perry PhD MD in "Child Abuse on the Brain" 1992

WHAT ARE ADVERSE CHILDHOOD EXPERIENCES???

Figure 1: Types of Adverse Childhood Experiences
Image courtesy of the Robert Wood Johnson Foundation

Center for Youth Wellness, Policy Report

RESULTS OF THE FIRST ACE'S STUDY

- 52% answered yes to one ACE
- 25% answered yes to two ACE's
- People experiencing 4 or more ACE's (12.5%) compared to those who experience NO ACE's were found to be:
  - 4-12 times more likely to experience health risks related to:
    - Alcoholism
    - Drug abuse
    - Depression
    - Suicide
      - ACE score of 7 increased suicide attempts 51 fold for child/adolescent and 30 fold for adults suicide attempts (ACE Reporter 2006).
  - 1.4-1.6 times more likely to be sedentary and severely obese.

RESULTS CONT'D

- The number of ACE's showed a graded relationship to the increased likelihood of these diseases:
  - Ischemic heart disease
  - Cancer
  - Chronic lung disease
  - Skeletal fractures
  - Liver disease

RESULTS CONT'D

- For each positive ACE, the chances of developing an autoimmune disorder increases by 20%.
- ACE score of 4=460% increase in having depression.
- ACE score of 6 decreases the life span by 20 years.*
  - "Childhood Disrupted" 2015 by D Jackson Nakazawa

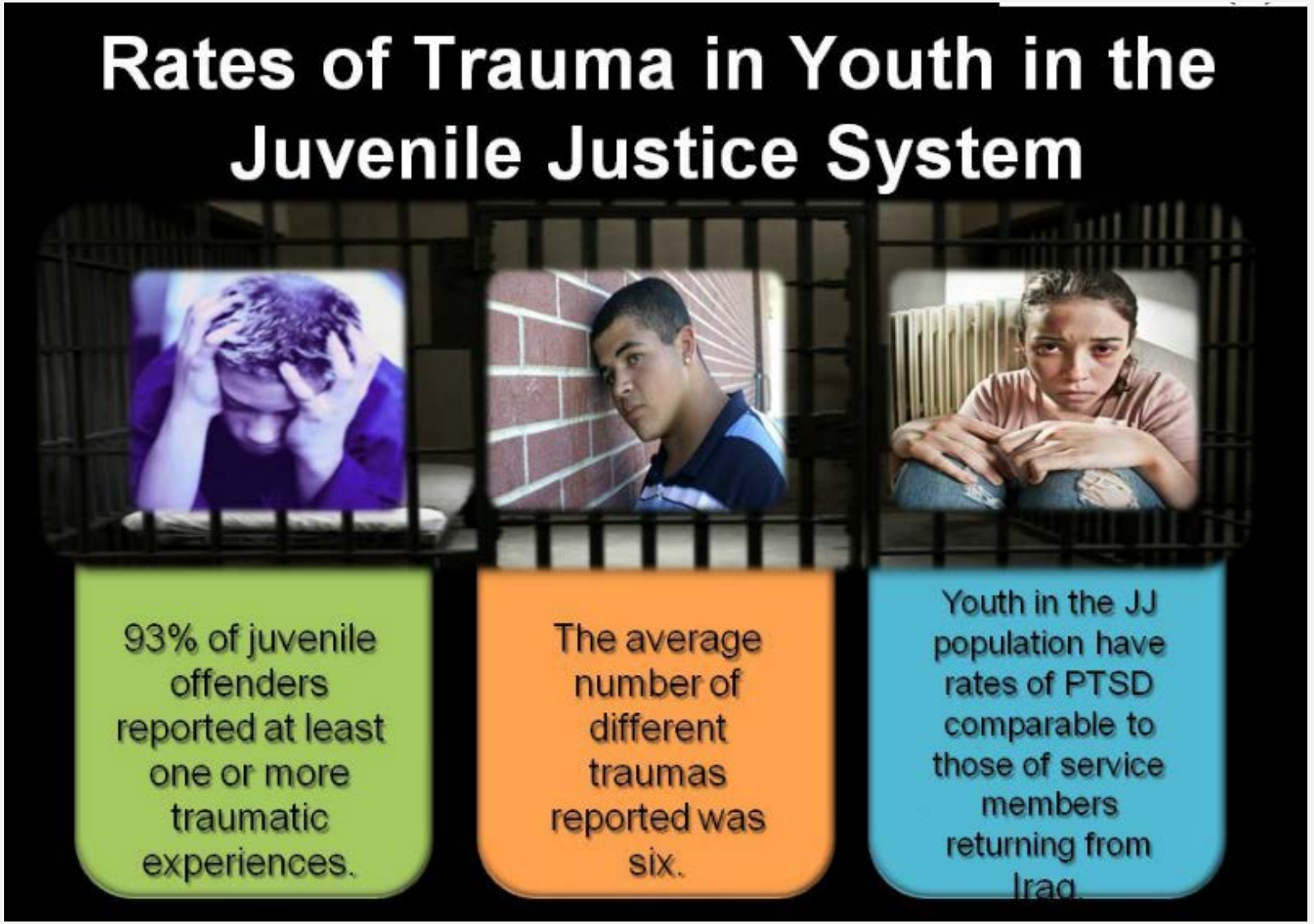
MECHANISMS OF POOR HEALTH

- Smoking
- Drug and alcohol use
- Overeating
- Sexual behaviors
- Risk taking
- Suicidality

- Even when participants: Didn't smoke
- Were not overweight
- Were not diabetic
- And had normal cholesterol

They had 360% higher risk of heart disease.

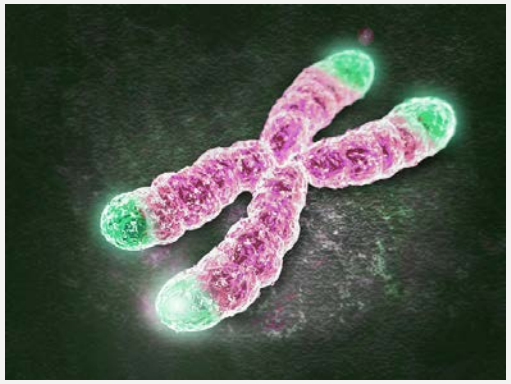
"Childhood Disrupted" 2015 by D Jackson Nakazawa


Rates of Trauma in Youth in the Juvenile Justice System
93% of juvenile offenders reported at least one or more traumatic experiences.
The average number of different traumas reported was six.
Youth in the JJ population have rates of PTSD comparable to those of service members returning from Iraq.

THE WHY….

- The Enduring Effects of Abuse and Related Adverse Experiences in Childhood: a convergence of evidence from neurobiology and epidemiology. 2006. Anda et al. Eur Arch Psychiatry Clin Neurosci. 256:174-186.
  - ACE's are common, kept secret and go unrecognized.
  - ACE's cause:
    - Release of catecholamines and adrenal corticosteroids
    - Damage developing neural networks
    - Damage neuroendocrine systems
    - Reduce the size of hippocampus and amygdala
    - Increase intra-abdominal fat deposition
    - Increase activity in the locus coeruleus
    - Altered release of dopamine
    - Altered oxytocin

WHY--GENETICS

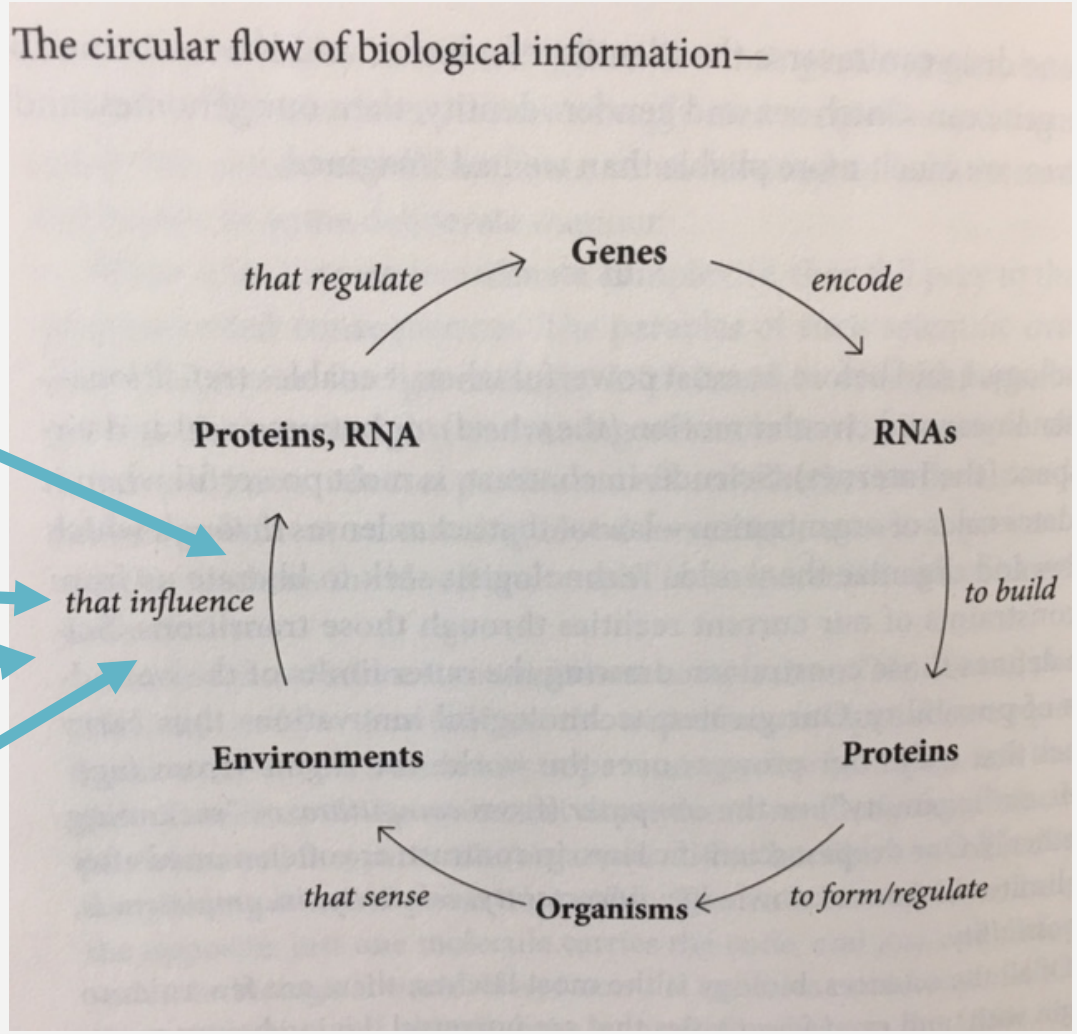


Retrotransposons

Methyl groups

Histones

Telomere damage



"The Gene: An Intimate History" 2016 by Siddhartha Mukherjee

CHANGES ASSOCIATED WITH STRESS/TRAUMA

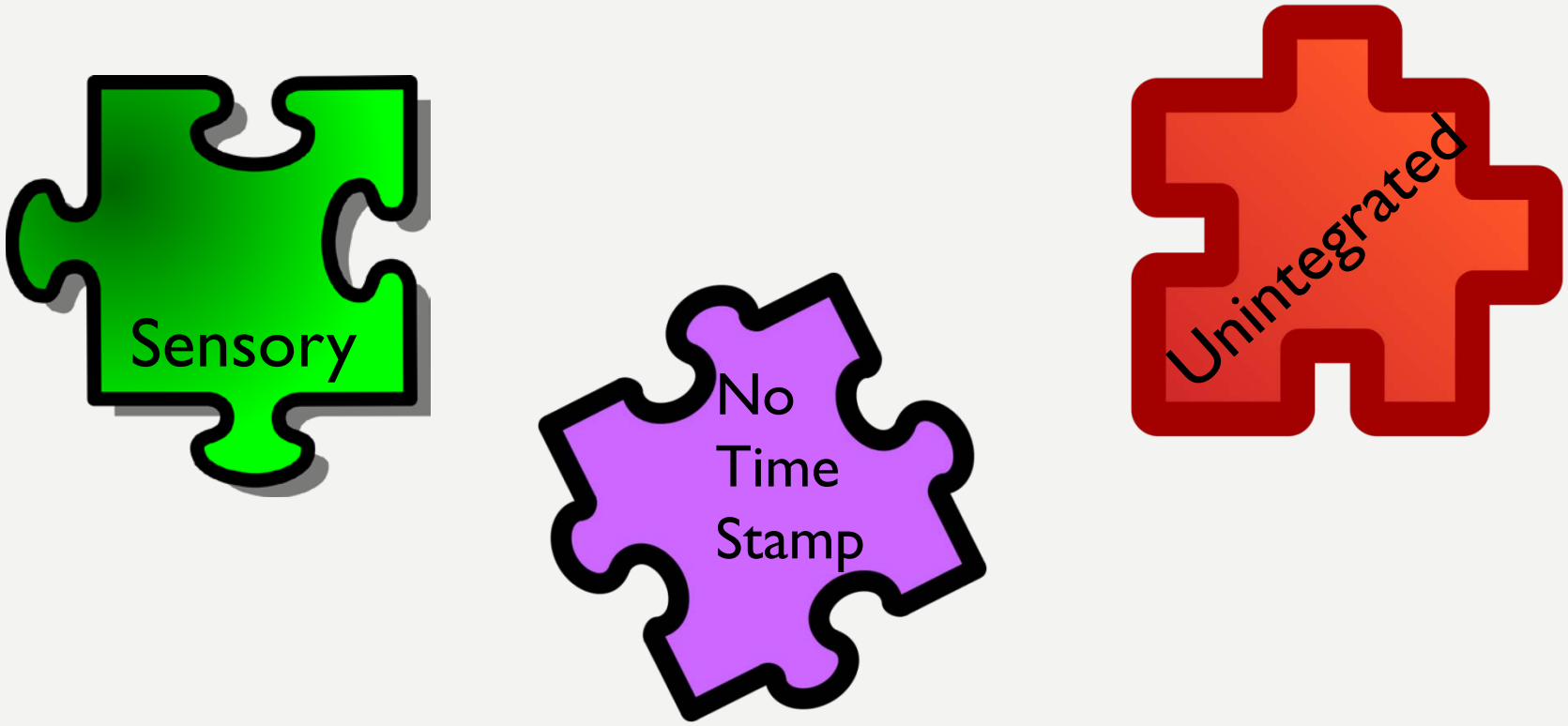
- The brain that doesn't work well:
  - Poor impulse control
  - Increased fear/panic responses-flight/fight/freeze
  - Poor cost/benefit decision making
  - Poor memory
  - Poor executive functioning, creativity
  - Poor relationality, empathy, compassion
- Neurotransmitters don't work well.
  - Depression, anxiety other mental illnesses

DOESN'T EVERYONE SAY THEY WERE ABUSED?

- "Retrospective reports of childhood abuse [that was documented at the time of its occurrence] are likely to underestimate actual occurrence…[due to] effects of traumatic stress in childhood on the hippocampus". Anda et al. 2006.
  - The actual occurrence of child abuse is likely much greater than is reported, remembered and acknowledged by victims.
    - Protected by secrecy and shame as well as the function of our brains.

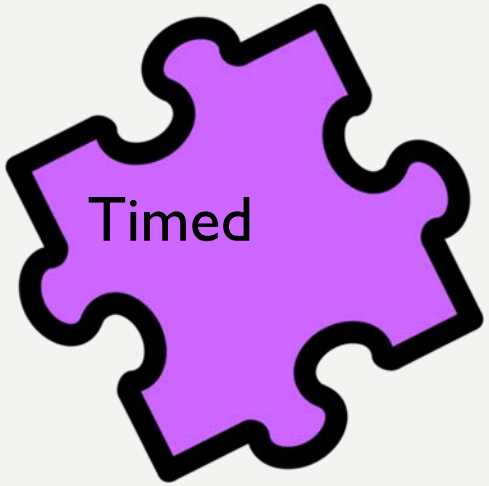
MEMORY

- **Implicit** vs Explicit memory.



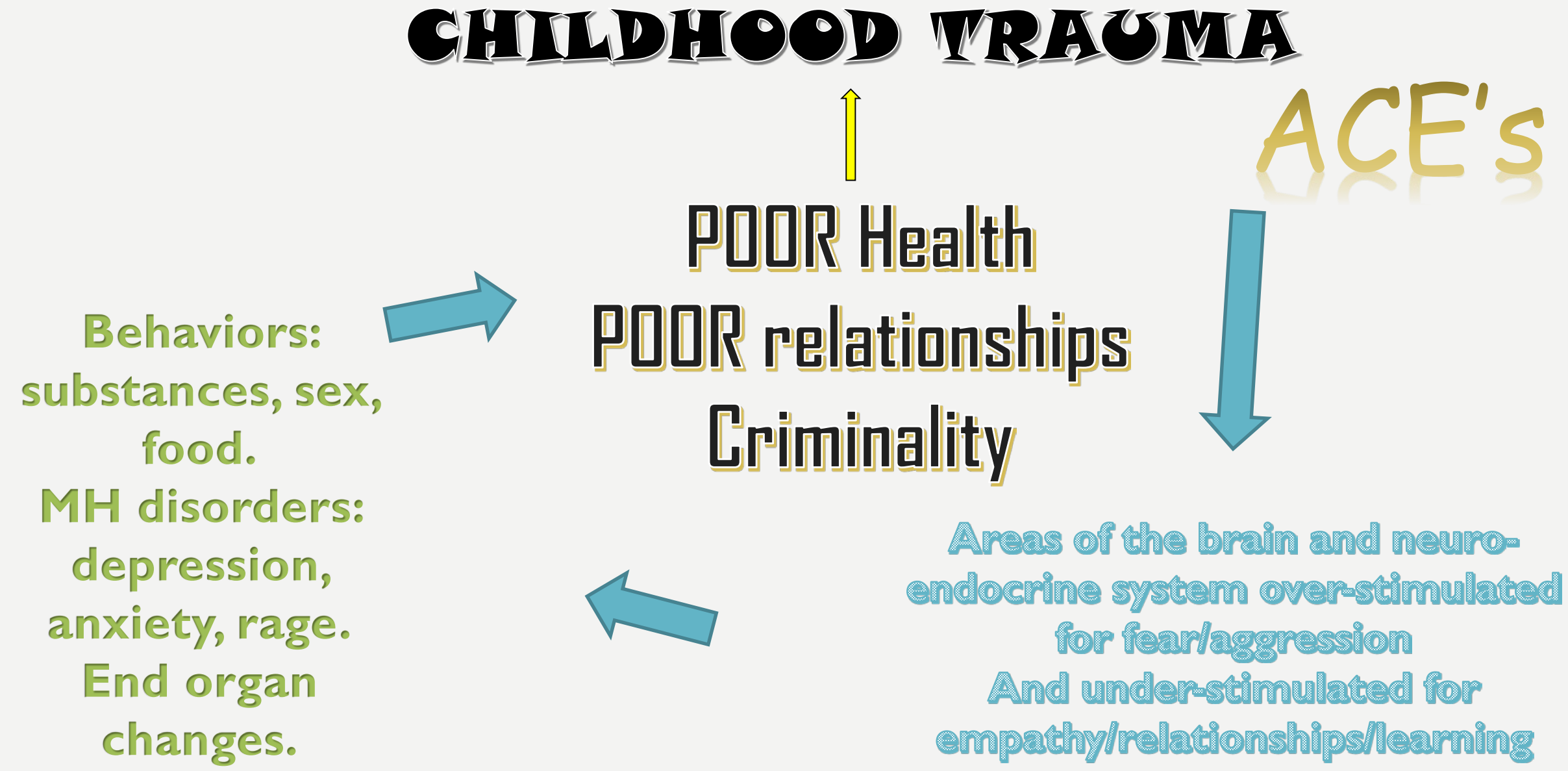
MEMORY

Implicit vs **Explicit** memory.



- "…severe and repeated trauma during youth may have enduring effects upon both neurobiological and psychological development altering stress responsivity and altering adult behavior patterns…these individuals experience a greatly increased risk of mood, anxiety and personality disorders throughout adult life."
  - USA Surgeon General

SUMMARY: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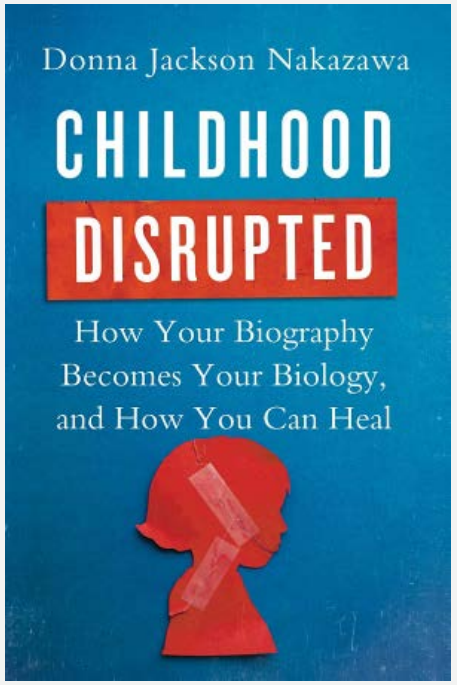
- "Hope lies in the potential presence of two key roles in a person's life: that of the 'helping witness,' a person who stands beside the endangered child while offering positive emotional support to the child; and that of the 'enlightened witness," who offers unconditional support to the adult suffering the long-term after effects of a traumatic childhood."

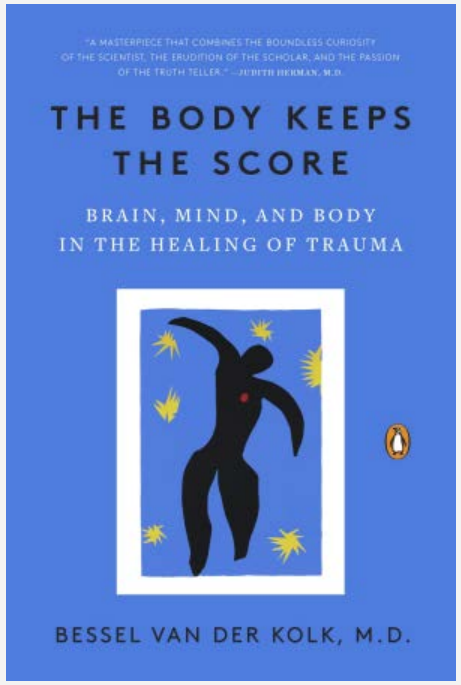
  - Alice Miller, "The Truth Will Set You Free…" 2002

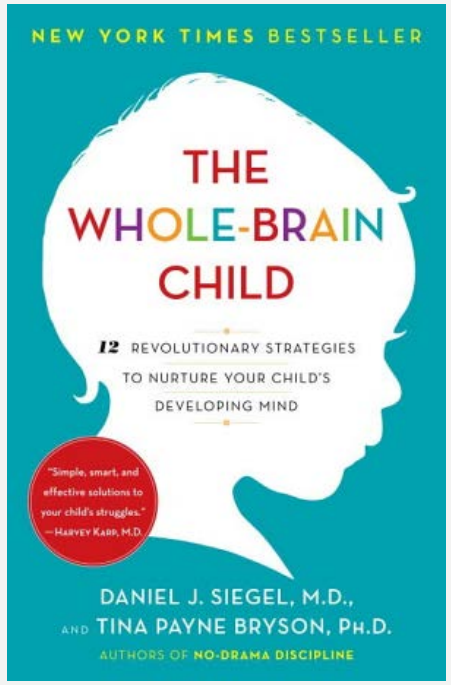
WHAT DO I WANT YOU TO REMEMBER?

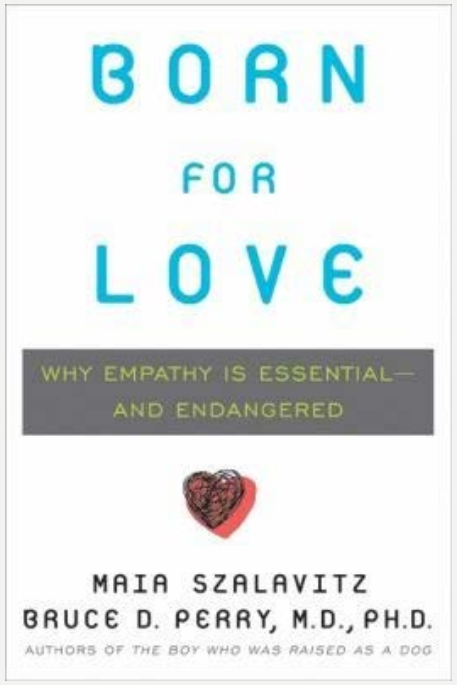
Children need to be cared for, from conception to young adulthood.

IF YOU ARE INTERESTED:









http://childtrauma.org/ The ChildTrauma Academy
http://www.nctsn.org/ National Child Traumatic Stress Network
http://www.lfcc.on.ca/mccain/perry.pdf Maltreatment and the Developing Child (McCain Lecture) 2004

CONTACT

- Deanna St. Germain, DO
- 541-682-3938
- Deanna@kidsfirstcenter.net