

EARLY  
DEVELOPMENT

ATTACHMENT  
AND  
EMOTIONAL  
REGULATION



**DEVELOPMENTAL PSYCHOLOGY**

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# 1. Learning happens when...

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„Learning involves consciously or nonconsciously attending to relevant aspects of incoming information, mentally organizing the information into a coherent cognitive representation, and integrating it with relevant existing knowledge activated from long-term memory.“ (APA)

- ❑ Optimal level of awareness (consciousness) and Attention (sustained, focused) - frontal lobe, basal ganglia, thalamus
- ❑ Thinking (evaluation of information, sorting, analyzing) – access to cortical regions
- ❑ Memory (working memory, storage) - hippocampus

**Cognitive processes are dependent upon mental/bodily state of arousal/activation = affect and its regulation** (limbic system and developed, functional prefrontal cortex)

**impaired self-regulation of affect = impaired learning**

# Repetition: Biology of emotions

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**Brain** (limbic system) - amygdala -> processes the information quickly and sends signals to the hypothalamus, which in turn activates the autonomic nervous system.

The cortex -> processes the information more slowly, allowing people to **appraise or evaluate the event** and **choose/modulate reaction**. The cortex under an influence of a strong emotion is more likely to process information incorrectly.

## **Autonomic nervous system:**

Sympathetic nervous system involves expending energy (fight or flight)

Parasympathetic nervous system works to keep energy in the body (rest/repair and digest)

# AUTONOMIC NERVOUS SYSTEM: PRECISION REGULATION

## \*\* WHAT TO LOOK FOR \*\*

	LETHARGIC Parasympathetic I (PNS I)	CALM Parasympathetic II (PNS II) <i>Ventral Vagus</i>	ACTIVE/ALERT Sympathetic I (SNS I)	FLIGHT/FIGHT Sympathetic II (SNS II)	HYPER FREEZE Sympathetic III (SNS III)	HYPO FREEZE Parasympathetic III (PNS III) <i>Dorsal Vagus Collapse</i>
		◀ "Normal" Life ▶			◀ Threat to Life ▶	
PRIMARY STATE	Apathy, Depression	Safe, Clear Thinking, Social Engagement	Alert, Ready to Act	React to Danger	Await Opportunity to Escape	Prepare for Death
AROUSAL	Too Low	Low	Moderate	High	Extreme Overload	Excessive Overwhelm Induces Hypoarousal
MUSCLES	Slack	Relaxed/toned	Toned	Tense	Rigid (deer in the headlights)	Flaccid
RESPIRATION	Shallow	Easy, often into belly	Increasing rate	Fast, often in upper chest	Hyperventilation	Hypo-ventilation
HEART RATE	Slow	Resting	Quicker or more forceful	Quick and/or forceful	Tachycardia (very fast)	Bradycardia (very slow)
BLOOD PRESSURE	Likely low	Normal	On the rise	Elevated	Significantly high	Significantly low
PUPILS, EYES, EYE LIDS	Pupils smaller, lids may be heavy	Pupils smaller, eyes moist, eye lids relaxed	Pupils widening, eyes less moist, eye lids toned	Pupils very dilated, eyes dry, eye lids tensed/raised	Pupils very small or dilated, eyes very dry, lids very tense	Lids drooping, eyes closed or open and fixed
SKIN TONE	Variable	Rosy hue, despite skin color (blood flows to skin)	Less rosy hue, despite skin color (blood flows to skin)	Pale hue, despite skin color (blood flow to muscles)	May be pale and/or flushed	Noticeably pale
HUMIDITY	Skin	Dry	Dry	Increased sweat	Increased sweat, may be cold	Cold sweat
	Mouth	Variable	Moist	Less moist	Dry	Dry
HANDS & FEET (TEMPERATURE)	May be warm or cool	Warm	Cool	Cold	Extremes of cold & hot	Cold
DIGESTION	Variable	Increase	Decrease	Stops	Evacuate bowel & bladder	Stopped
EMOTIONS (LIKELY)	Grief, sadness, shame, disgust	Calm, pleasure, love, sexual arousal	Anger, shame, disgust, anxiety, excitement, sexual climax	Rage, fear	Terror, may be dissociation	May be too dissociated to feel anything
CONTACT WITH SELF & OTHERS	Withdrawn	Probable	Possible	Limited	Not likely	Impossible
FRONTAL CORTEX	May or may not be accessible	Should be accessible	Should be accessible	May or may not be accessible	Likely inaccessible	Inaccessible
INTEGRATION	Not likely	Likely	Likely	Not likely	Impossible	Impossible
RECOMMENDED INTERVENTION	Activate, Gently Increase Energy	Continue Therapy Direction	Continue Therapy Direction	Put on Brakes	Slam on Brakes	Medical Emergency CALL PARAMEDICS

\*Observe client states: To modulate arousal with brakes. Adjust in yourself: To think clearly & prevent vicarious trauma & compassion fatigue.

# Early brain development

90% of brain development happens before the age of five.

Neurons that fire together wire together

Neural pruning - 'use it or lose it'

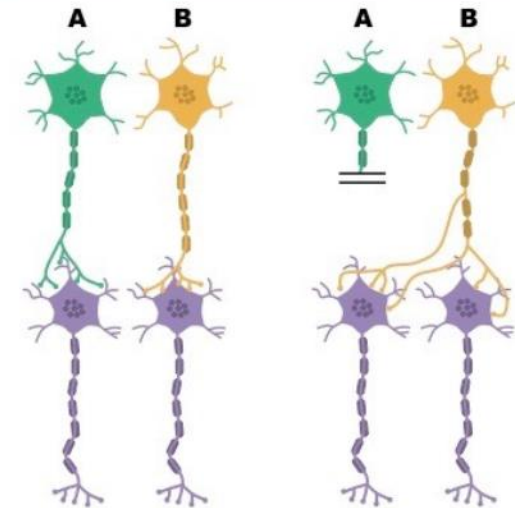
Myelination

Sensitive periods - brain cell connections are more plastic and receptive to the influence of a certain kind of life experience

Critical periods - limited time frame during which certain development can occur

Plasticity - structural and functional changes in the brain that happen as a result of new experiences

**Sprouting:** New axon and dendrite extensions allow existing neurons to form new connections



Neural connections by neuron A and neuron B prior to degeneration

Collateral sprouting of neuron B after damage to axon of neuron A

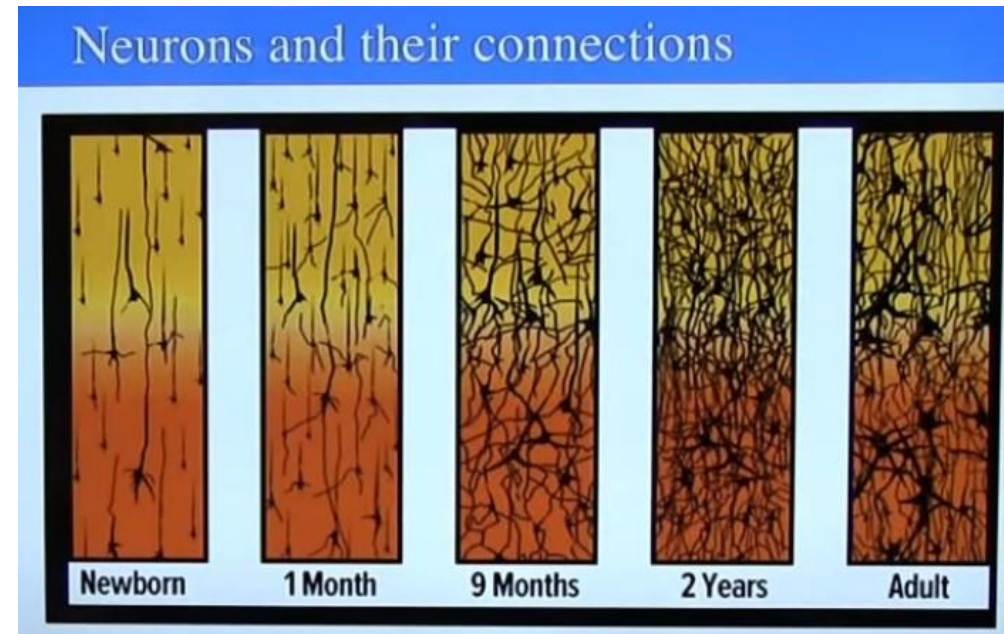
# Environmental interplay

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"The human cerebral cortex adds about 70% of its final DNA content after birth, and this expanding brain is directly influenced by early environmental enrichment and social experiences." (Alan Schore)

**Epigenetic changes** are modifications to DNA that regulate whether genes are turned on or off.

<https://developingchild.harvard.edu/resources/what-is-epigenetics-and-how-does-it-relate-to-child-development/>



# Attachment and brain development

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**Bowlby, Ainsworth** > Behavioural model of attachment in 60s-70s

**Alan Schore** > Cognitive model in 80s-90s Emotional (Affect) model of attachment

Right brain development (3rd trimester to second year of life), experience dependent growth

Process of **emotional regulation** = co-regulating process > right brain – to – right brain communication (mostly non-verbal: facial expression, tone of voice, gestures, posture, tactile)

- Includes both up playing of positive emotions and down playing of negative emotions
- Formation of the integrated self
- Connection to the body
- Formation of empathy

The ability to regulate one's emotions and behavior is a key aspect of **executive function**, the suite of skills that allow an individual to plan, monitor, and attain goals.

**Absence of secure early emotional relationship results in dysregulation**

**Can be shaped by later experience – requires relational experiences with an emotionally sensitive and empathetic other**

# Co-regulation of affect in infants



- Repeated experiences of co-regulation help strengthen neural connections in the prefrontal cortex, amygdala, and hypothalamus, which are involved in emotion regulation and stress response.
- Foundation for developing healthy attachment relationships and social skills

Edward Tronick, still face experiment (2.5 min) : <https://www.youtube.com/watch?v=leHcsFqK7So>



# Early exposure to stress

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Cumulative exposure to **cortisol** compromises the ability of neurons to withstand neuropathological insults. Has a neurotoxic effect on the **prefrontal cortex**.

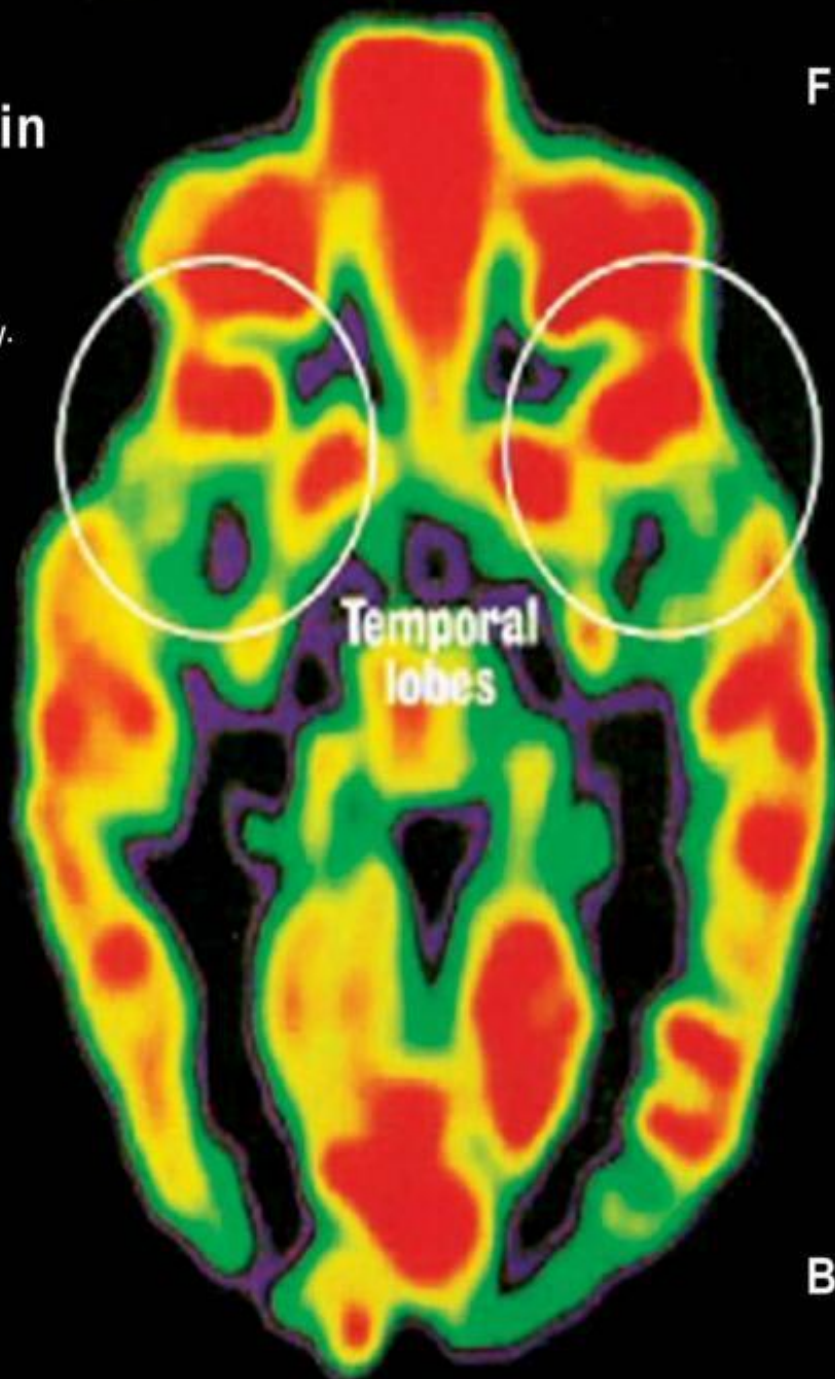
AMYGDALA - sets in motion the stress response. Overrides the prefrontal cortex. Shows volume increase. Increase in reactive behaviors.

HIPPOCAMPUS - Short-term memory loss. Neuronal loss. Impaired memory, sleep, immunity.

Trauma effect: chronic state of low- fear (alarm reaction) – they will respond by using either a dissociative or hyperarousal adaptation. Their functioning on every level (emotional, behavioral, cognitive) will reflect this state. With a prolonged alarm reaction, the child will experience an altered neural state.

## Healthy Brain

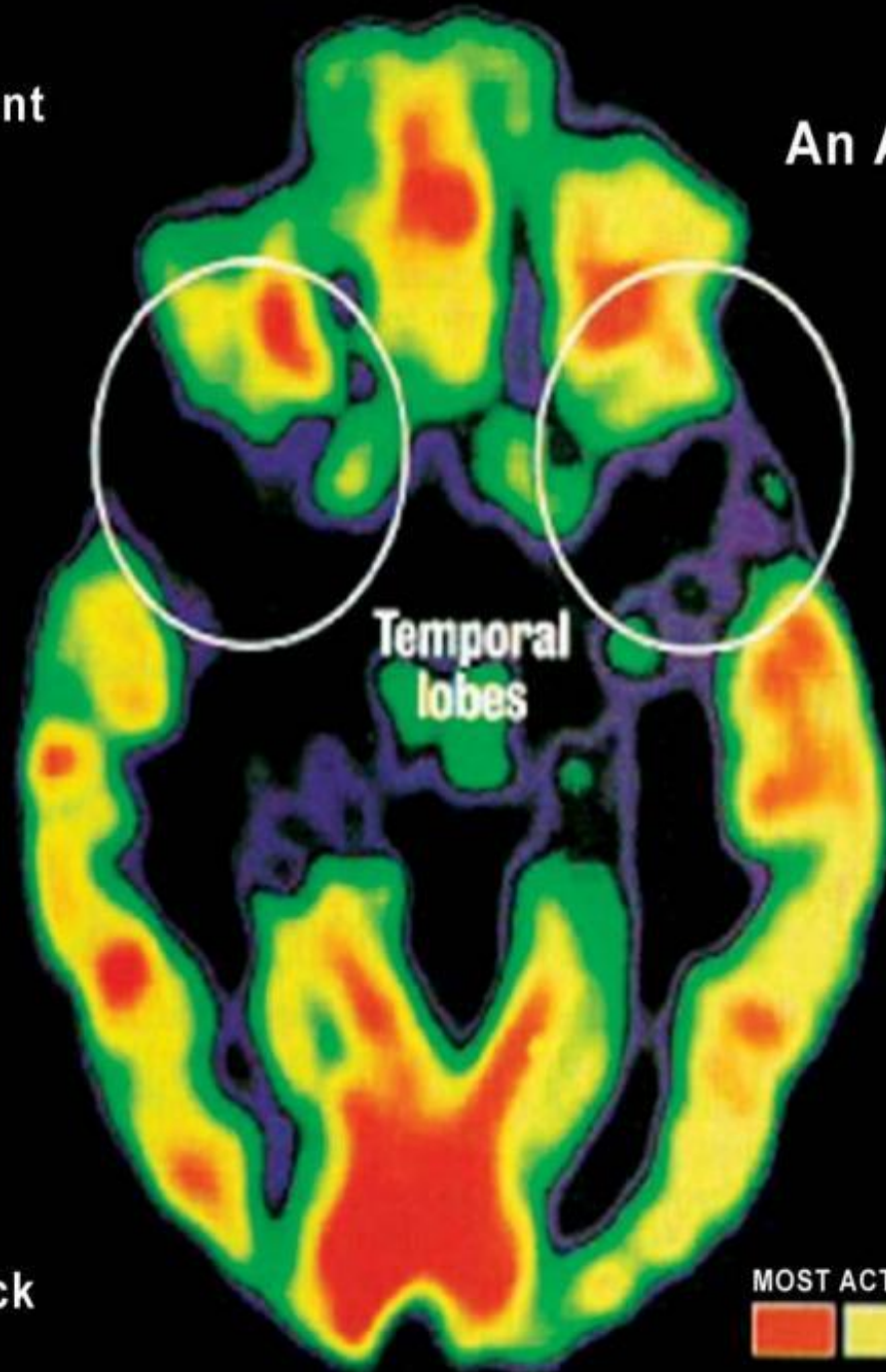
This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.



Front

## An Abused Brain

This PET scan of the brain of a Romanian Orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.

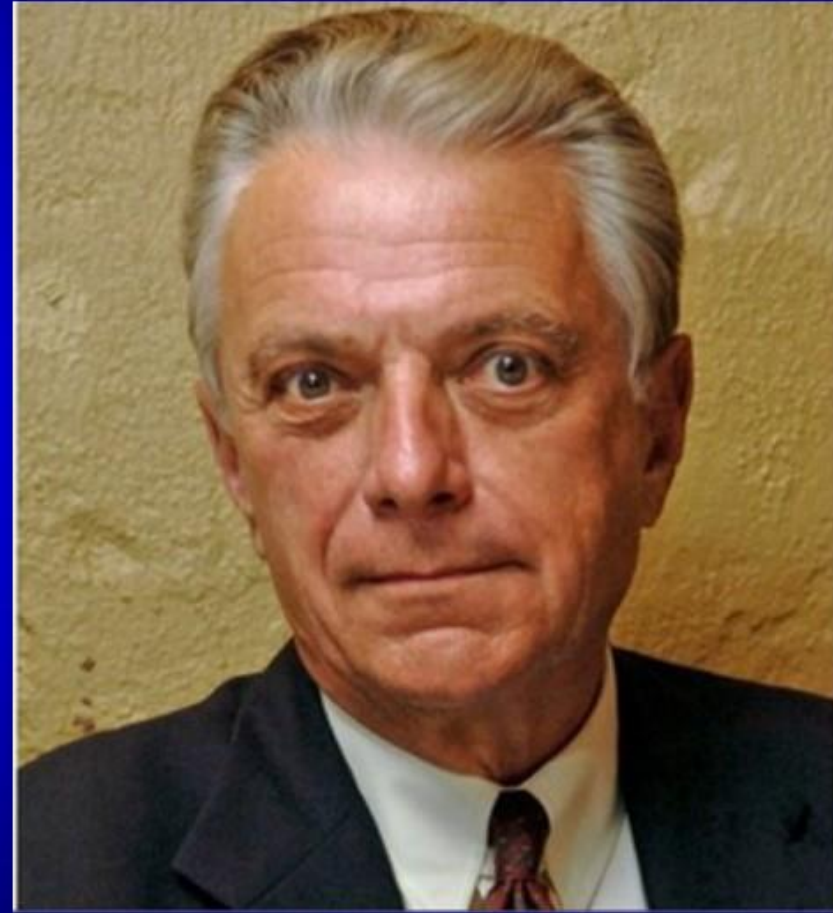


Back

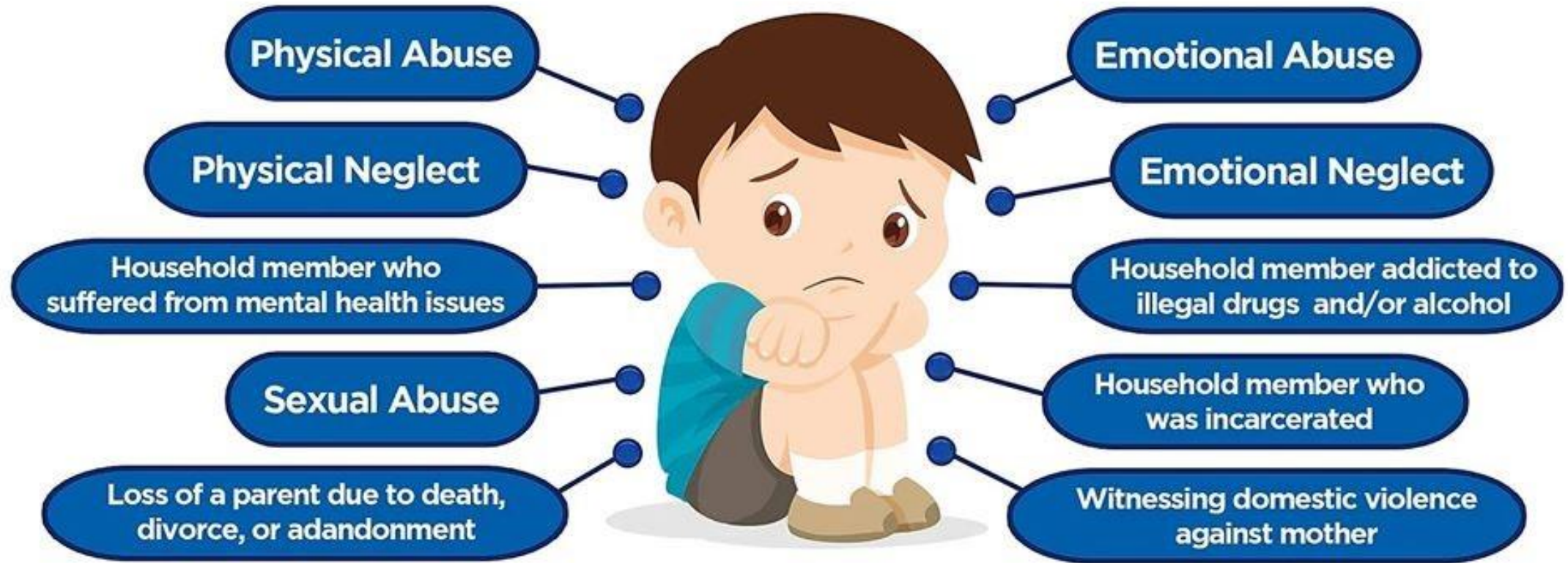


# Adverse Childhood Experiences (ACE) Study

- Dr Vincent Felitti
- Chief of Preventive Medicine at Kaiser Permanente
- Obesity Clinic 1985
- CDC
- [Short Video Introduction to ACE Study](#)



# ADVERSE CHILDHOOD EXPERIENCES INCLUDE:



## ADVERSE CHILDHOOD EXPERIENCES HAVE BEEN LINKED TO:



# Adverse Childhood Experiences (ACEs): Impact on brain, body and behaviour

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**Adverse Childhood Experiences (ACEs): Impact on brain, body and behaviour**

<https://www.youtube.com/watch?v=W-8jTTIsJ7Q&app=desktop> (6 min)

**Childhood Trauma and the Brain | UK Trauma Council**

<https://www.youtube.com/watch?v=xYBUY1kZpf8> (5 min)

# Examples of ACEs prevalence

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## CZECH REPUBLIC

- Physical abuse: 24% - 19.9%
- Emotional abuse: 34% - 37.8%
- Sexual abuse: 6% - 4.4%
- Physical neglect: 8.4%
- Emotional neglect: 27.4%

Domestic violence witness: 22%-26%

Substance abuse: 20%

Skalická, V., & Jurčová, D. (2016). Prevalence of child abuse and neglect in the Czech Republic. *Central European Journal of Public Health*, 24  
European Survey of Children's Exposure to Violence (SEV) (Barudyova et al., 2019)

## SWEDEN

- Physical abuse: 2.2%
- Emotional abuse: 7.8%
- Sexual abuse: 1.3%
- Physical neglect: 3.6%
- Emotional neglect: 11.6%

Swedish Living Conditions Survey (ULF) (Statistics Sweden, 2019)

## USA

- Physical abuse: 14.8%
- Emotional abuse: 22.6%
- Sexual abuse: 10.8%
- Physical neglect: 9.4%
- Emotional neglect: 15.4%
- Household substance abuse: 10.9%
- Household mental illness: 18.0%
- Parental separation or divorce: 15.8%
- Witnessing domestic violence: 7.5%

Centers for Disease Control and Prevention. (2020). Behavioral Risk Factor Surveillance System ACE Data.

# Strategies for Promoting Emotional Regulation in Children

Parents, caregivers, and educators can use various strategies to promote emotional regulation in children, such as:

- Teaching children to recognize and label their emotions
- Providing a safe and supportive environment for emotional expression
- Encouraging healthy coping strategies, such as deep breathing or physical activity
- Modeling healthy emotional regulation behaviors

## Signs of Emotional Dysregulation



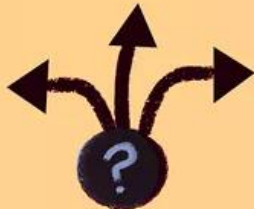
Overly intense emotions



Impulsive behavior



Lack of emotional awareness



Trouble making decisions



Inability to manage behavior



Avoids difficult emotions