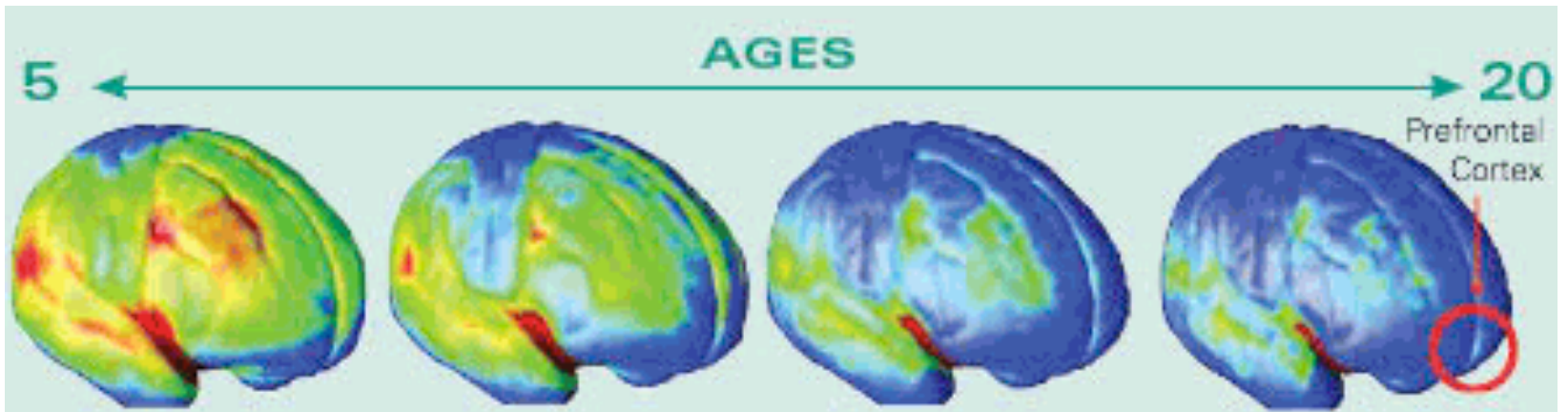


Science of High-Risk Behavior

Crystal Collier, PhD, LPC-S

Director of the Behavioral Health Institute

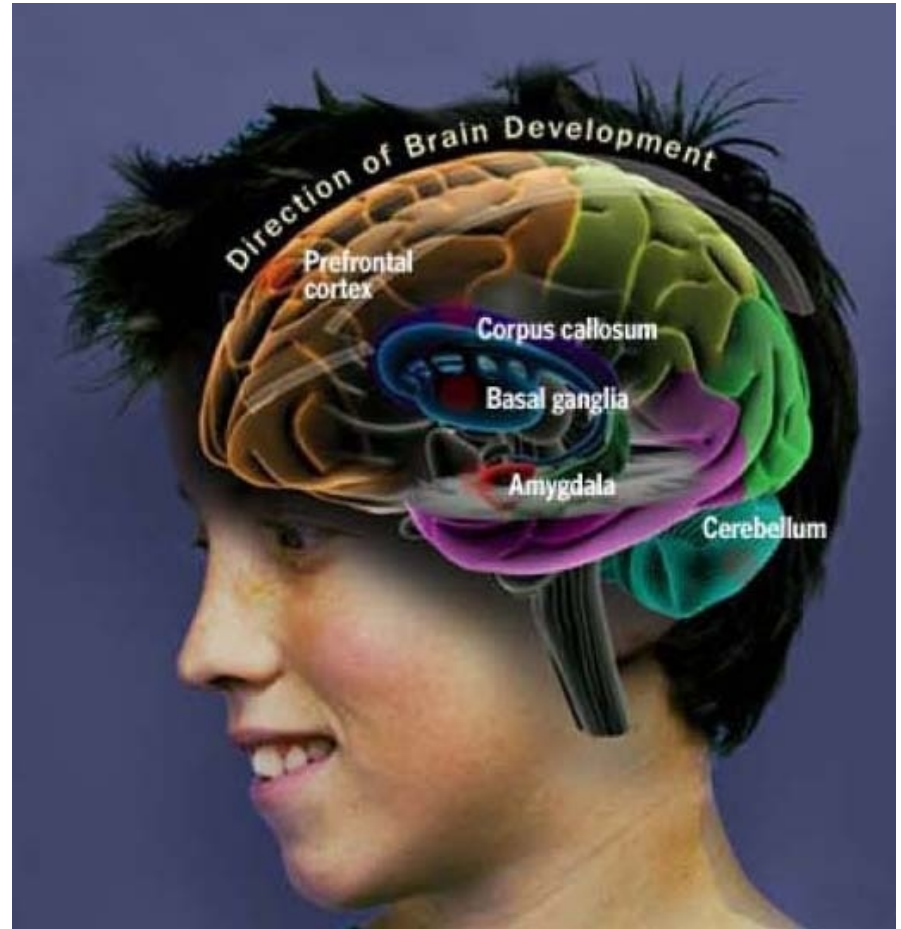


Blue represents maturing of brain areas.



*A teenager's brain
"has a well-
developed
accelerator but
only a partly
developed brake."*

Laurence
Steinberg



200 Billion
Neurons



AGE

11-12

200

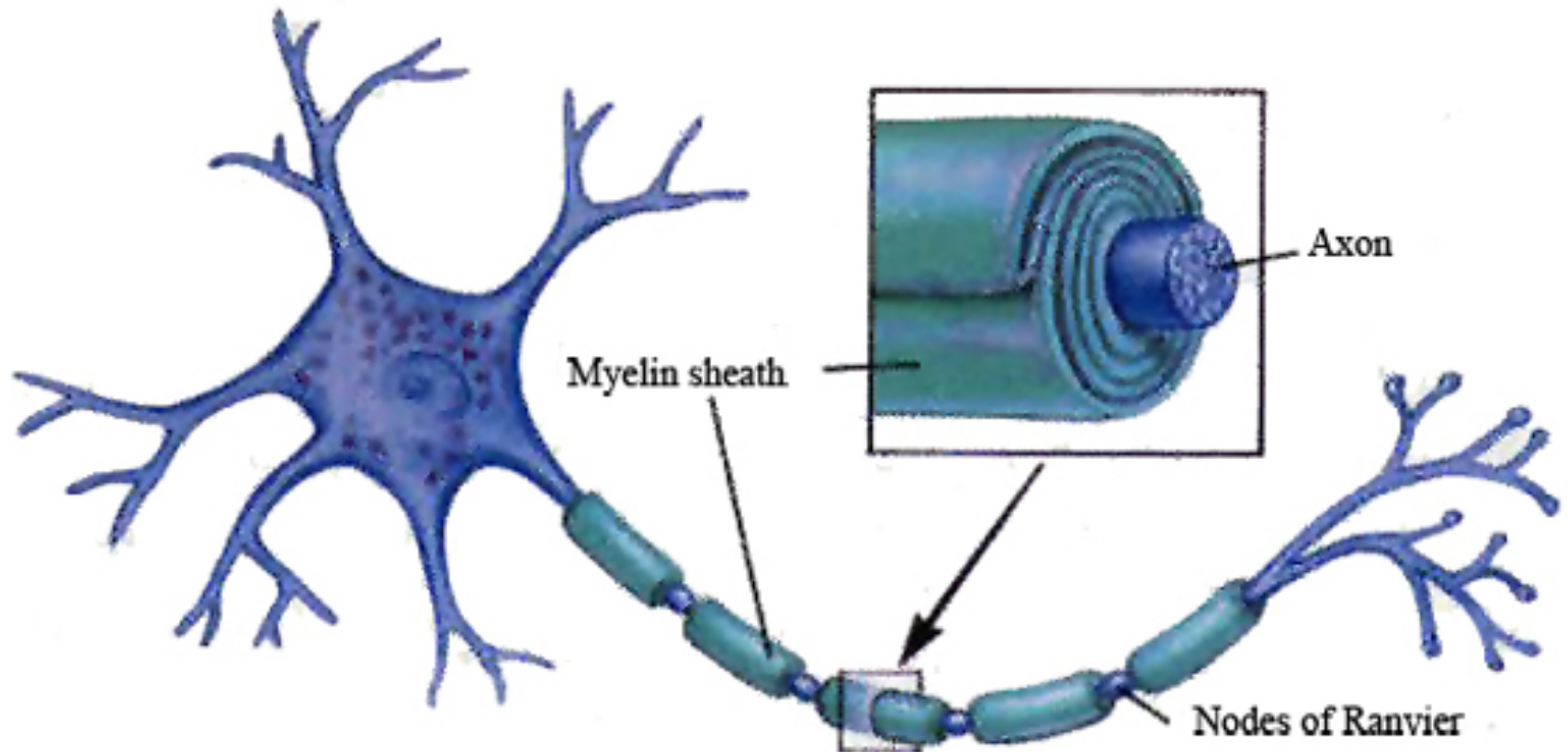


24-25

100

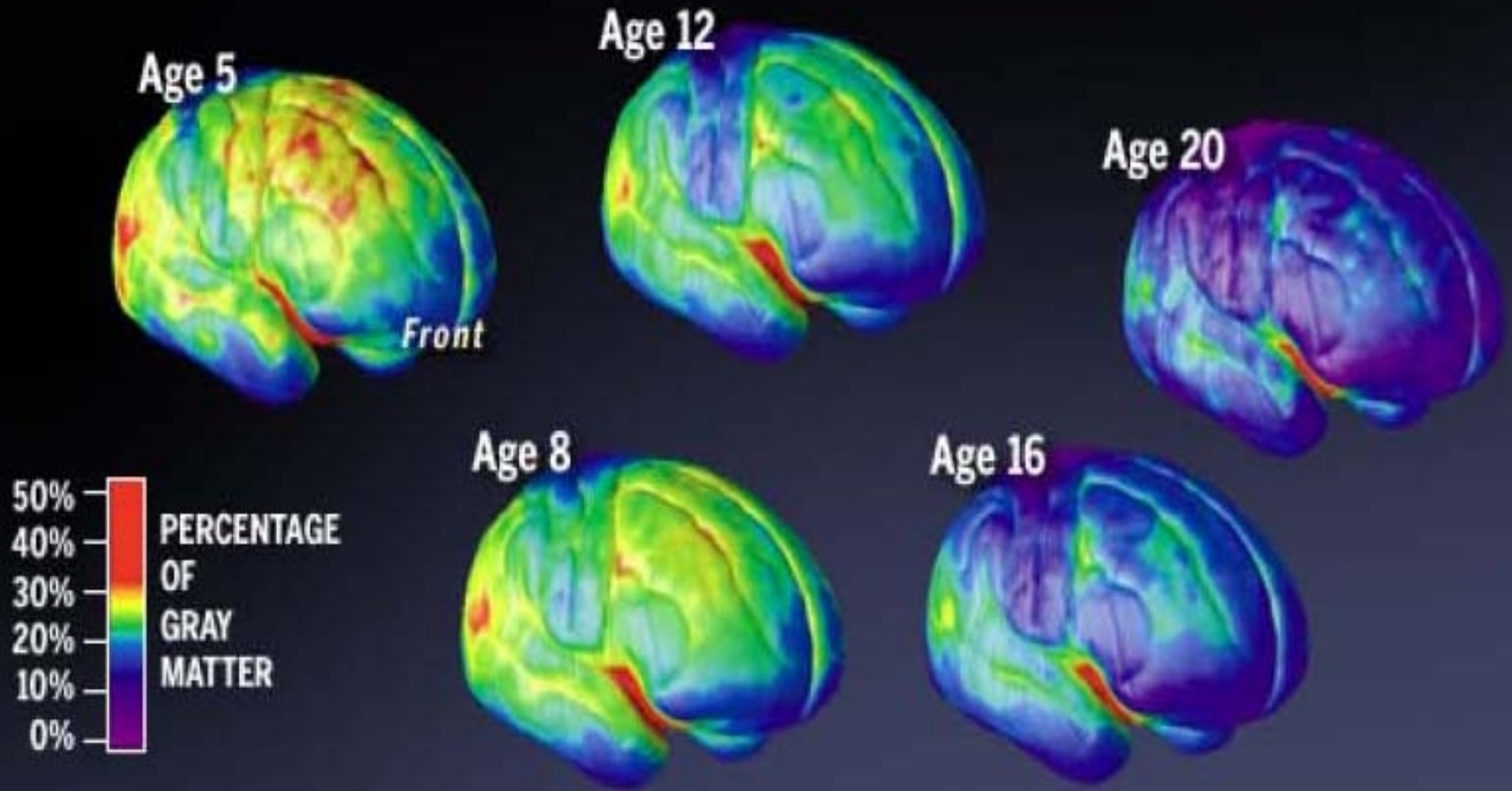


Myelin = Processing Speed

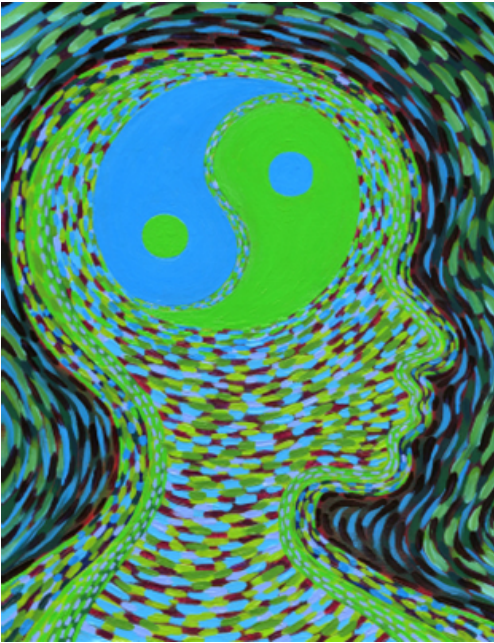








USE IT OR LOSE IT PRINCIPLE

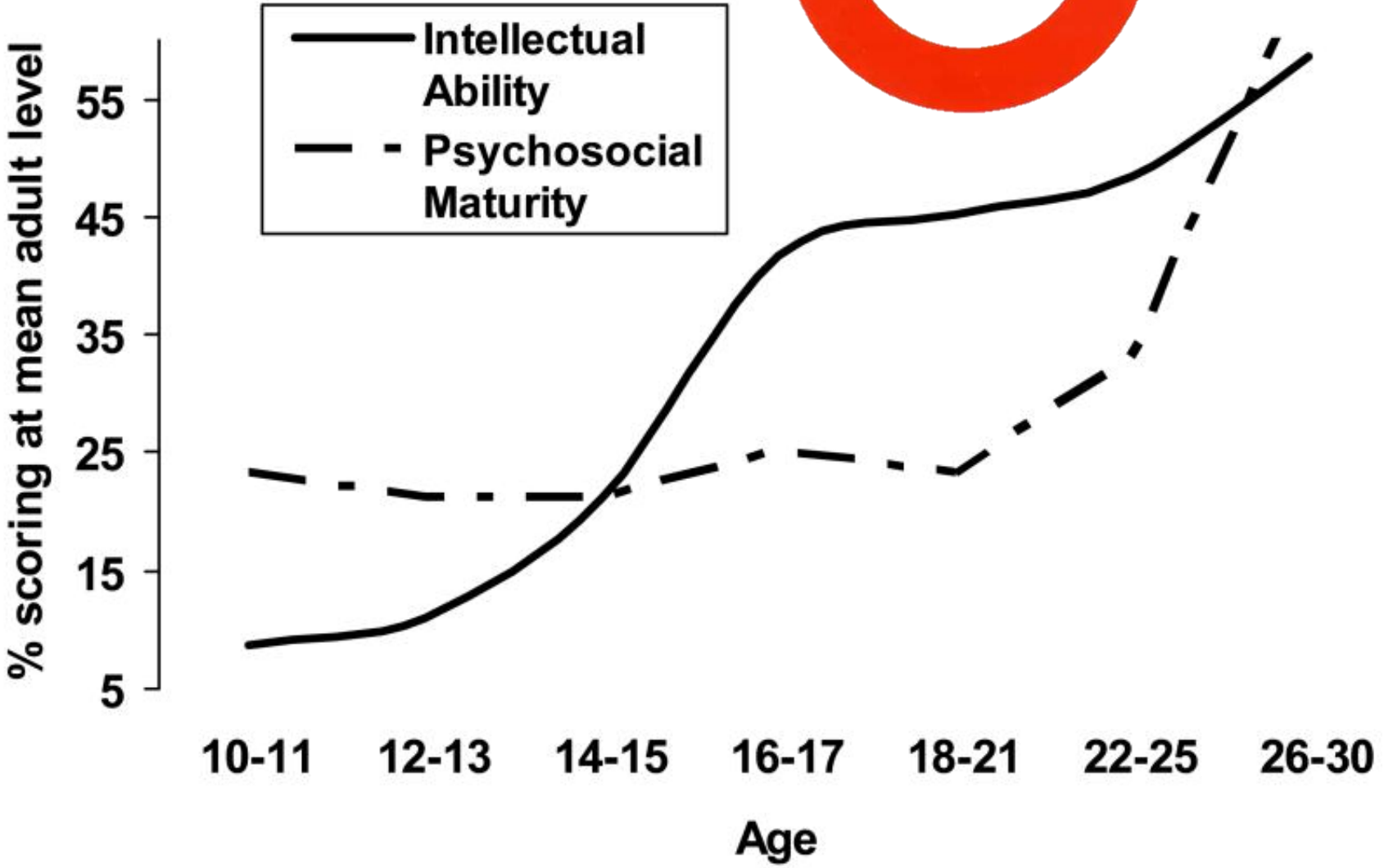


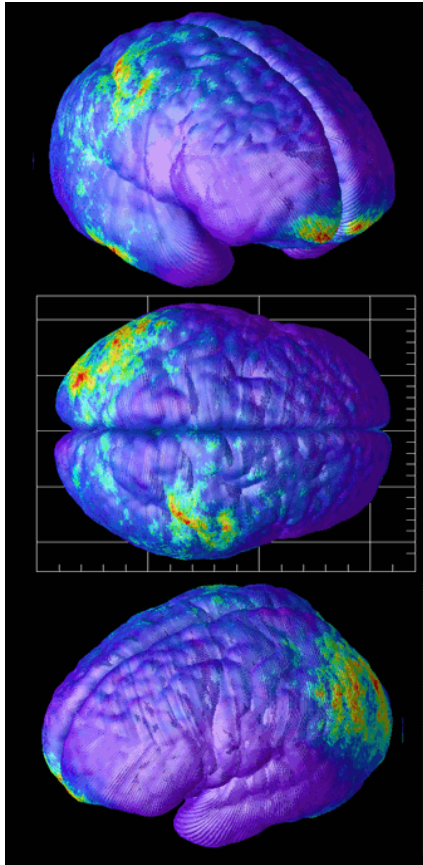
- Pruning (Apoptosis) clears out unneeded wiring to make way for more efficient and faster information-processing (thicker myelin)
- Rich experiences = Promotes building long chains of nerve cells needed for demanding problem-solving

From Immature, Child Responding to Mature, Adult Thinking: The Road to Executive Function

- Abstract; conceptual understanding
 - Impulse Control
 - Problem-Solving
 - Decision-Making
 - Judgment
 - Emotion Regulation
 - Frustration Tolerance
 - Ability to Feel Empathy

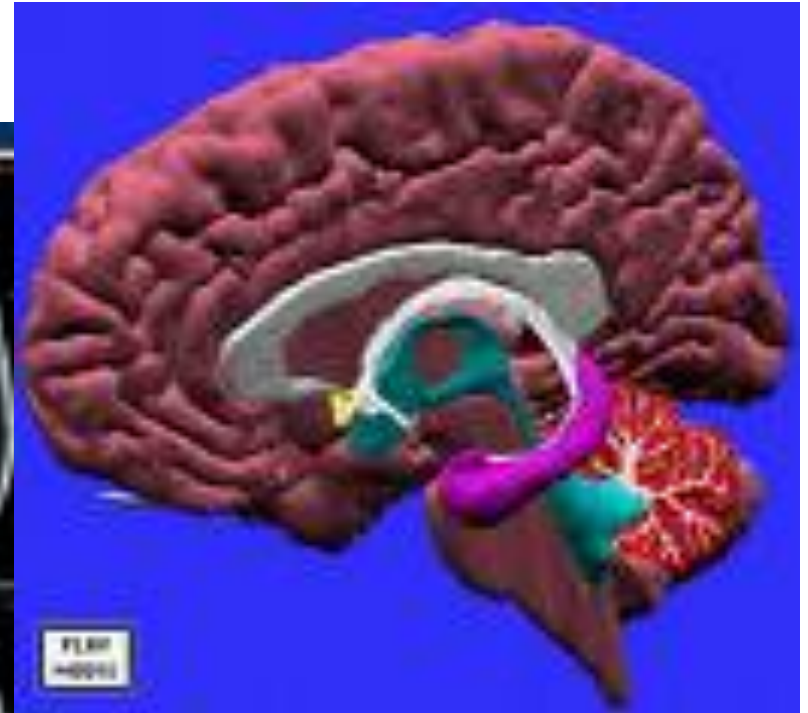
MIND THE GAP





**How do
drugs, alcohol, &
trauma effect the
brain during the
pruning process?**

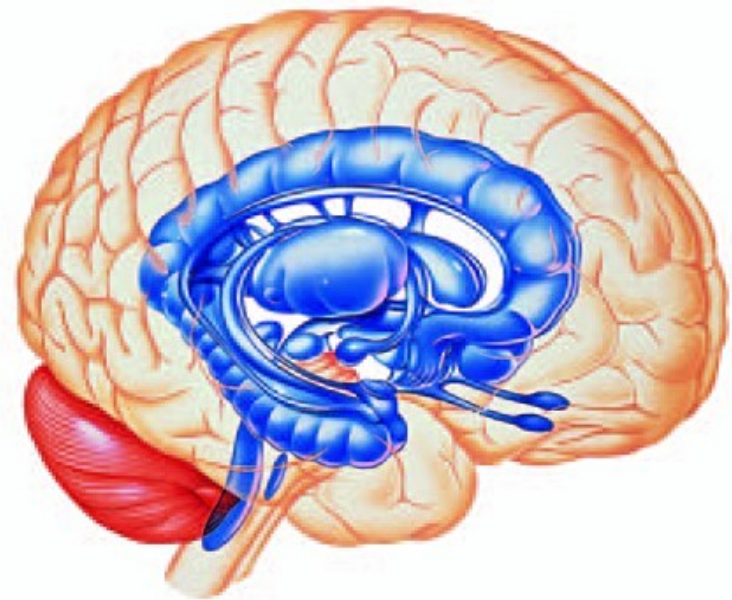
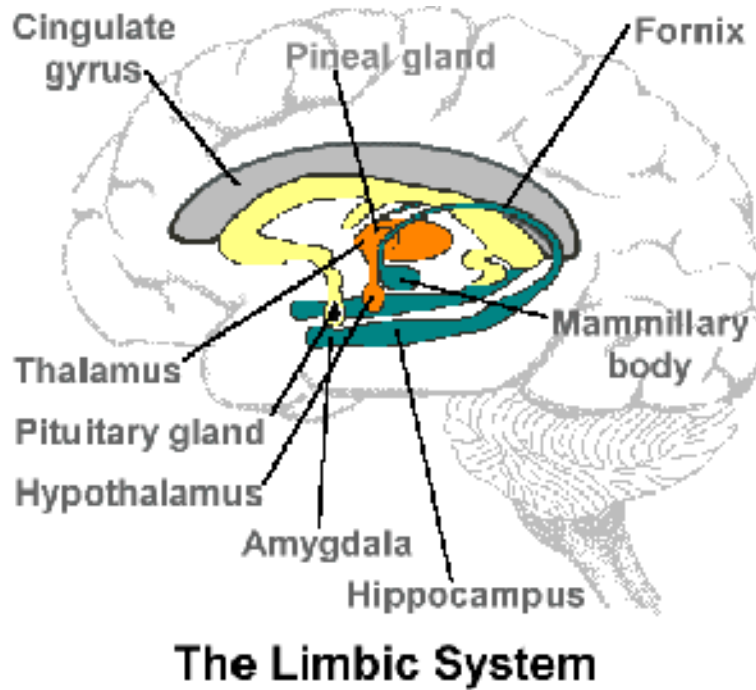
Midbrain: Survival Mode



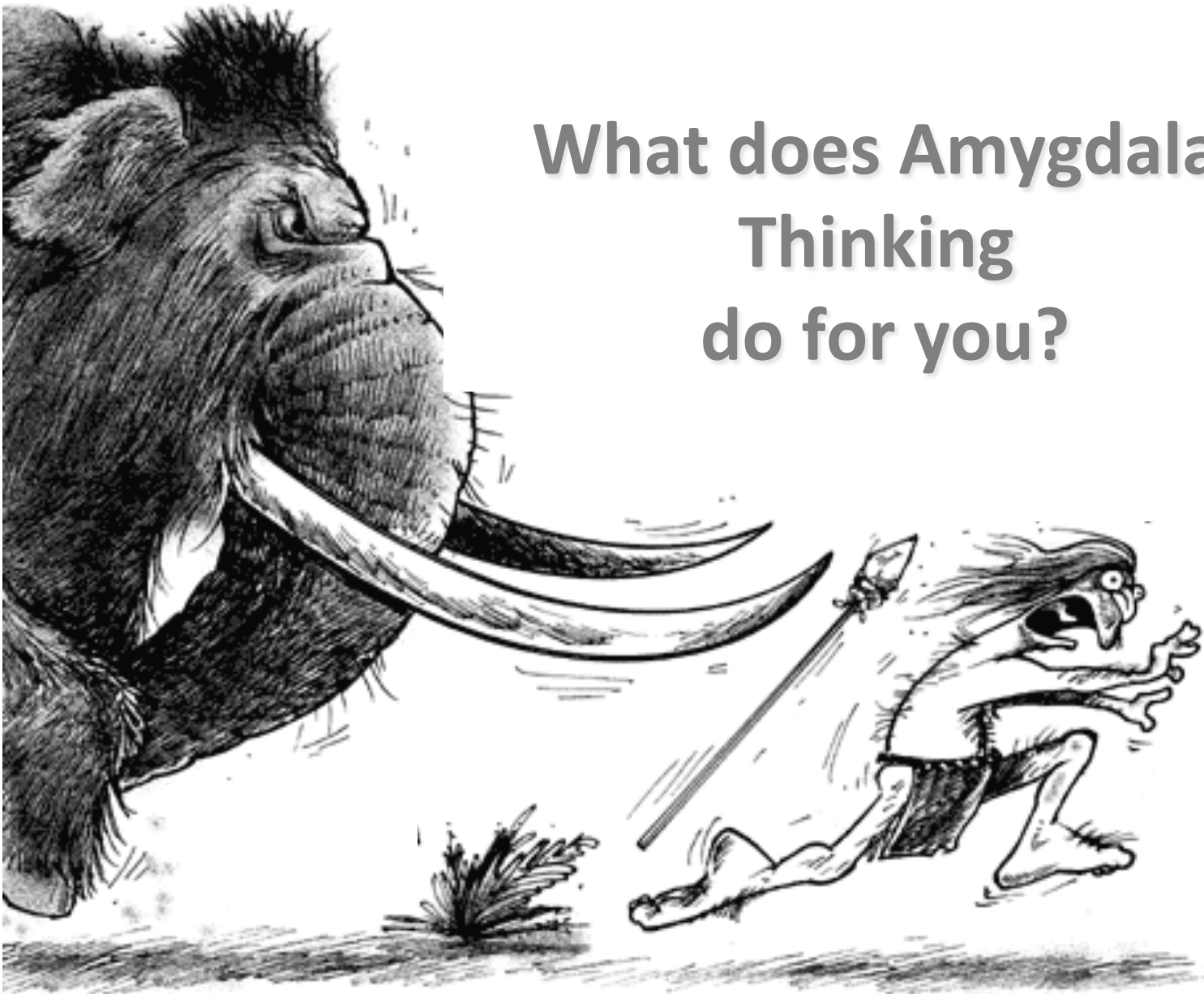
- Eat it
- Kill it
- Have sex with it

Limbic System

- 1) Survival: Fight or Flight
- 2) Pleasurable Experiences



What does Amygdala
Thinking
do for you?



Cox &
Forkum
©2005

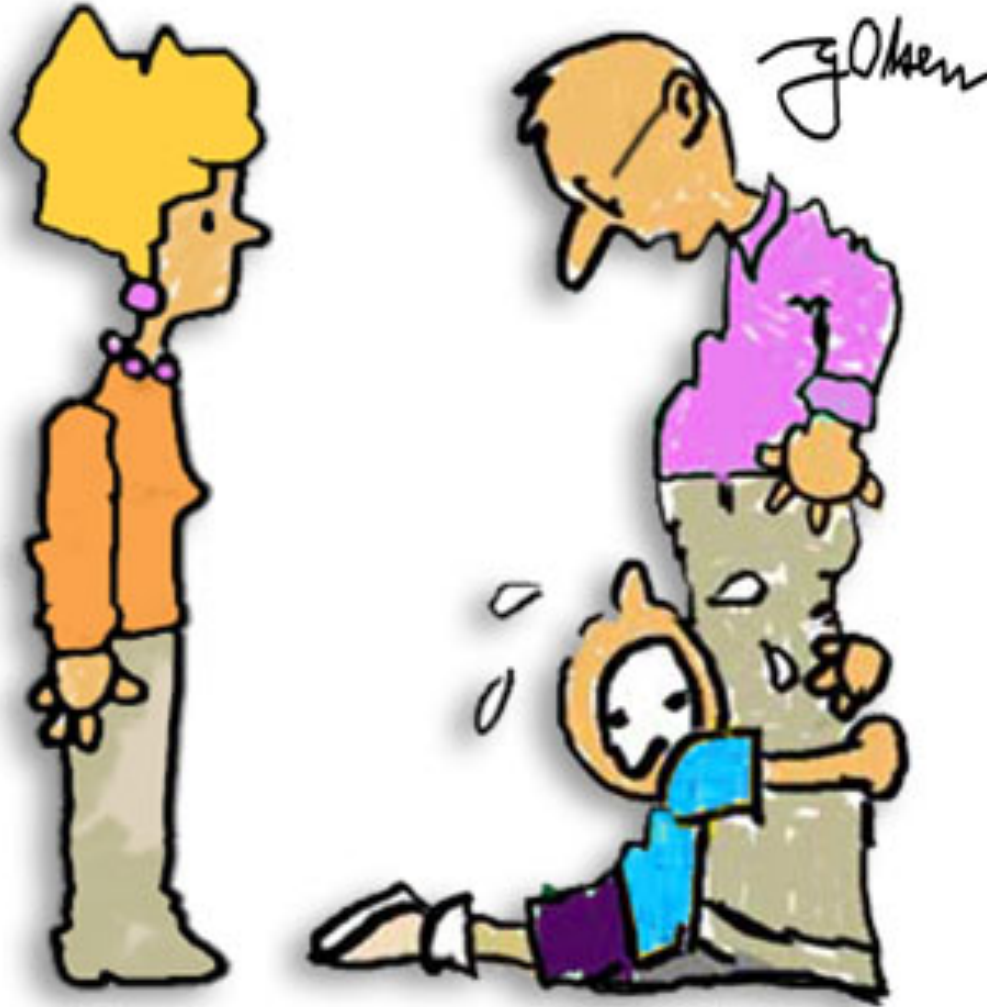
www.CoxAndForkum.com

Today's Threats?



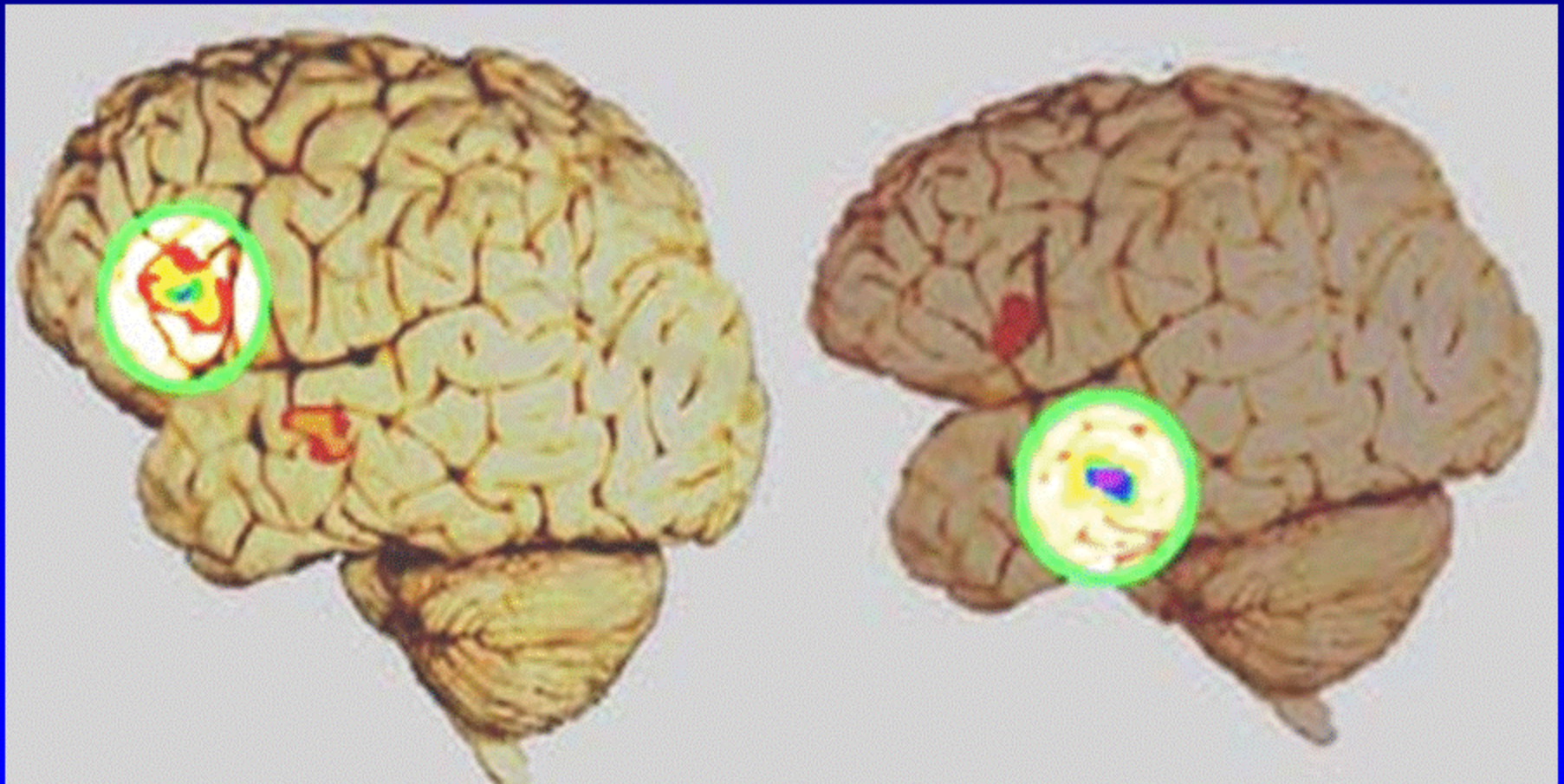
No, you can't have your iPhone.

But to a teenage brain...

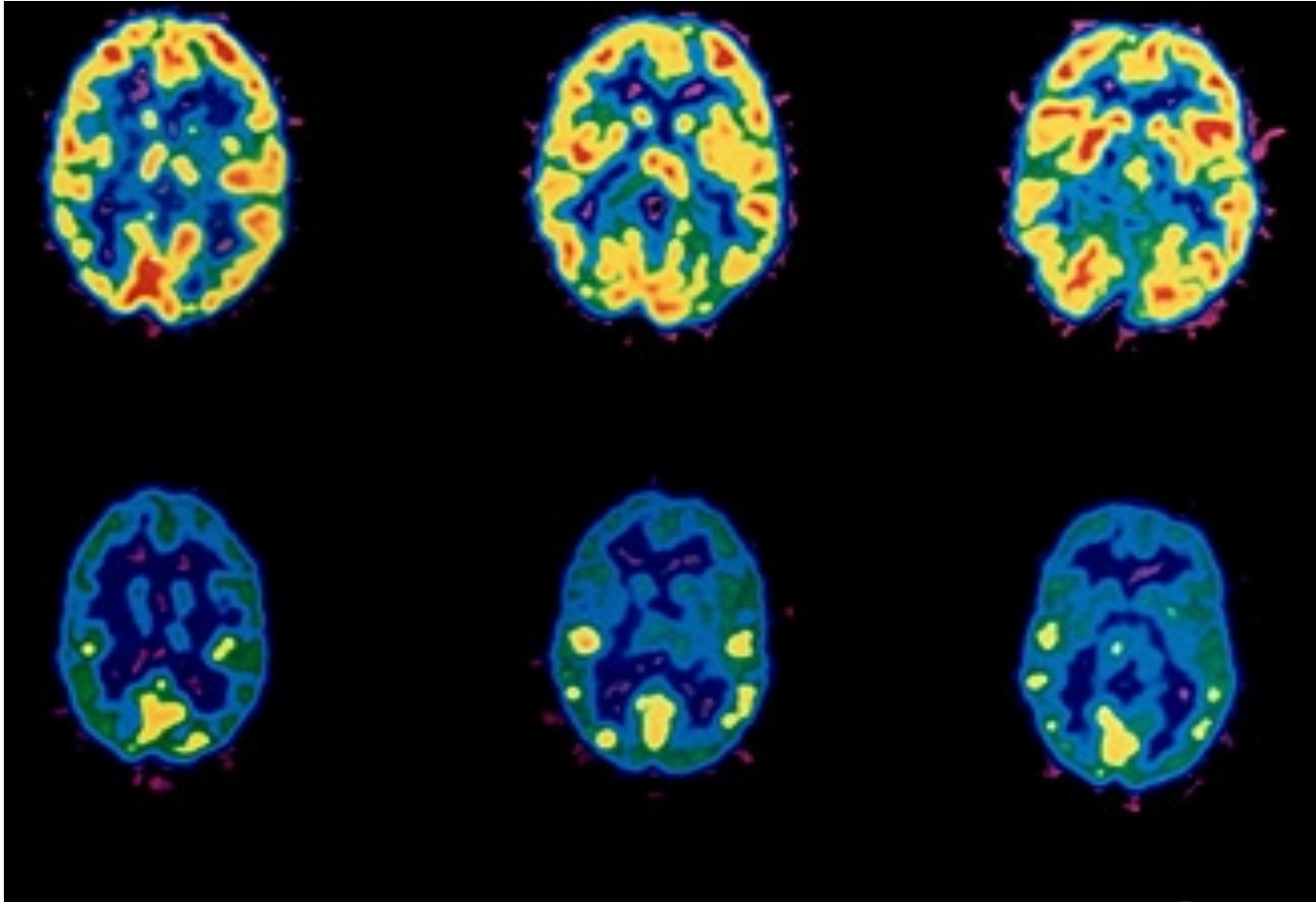


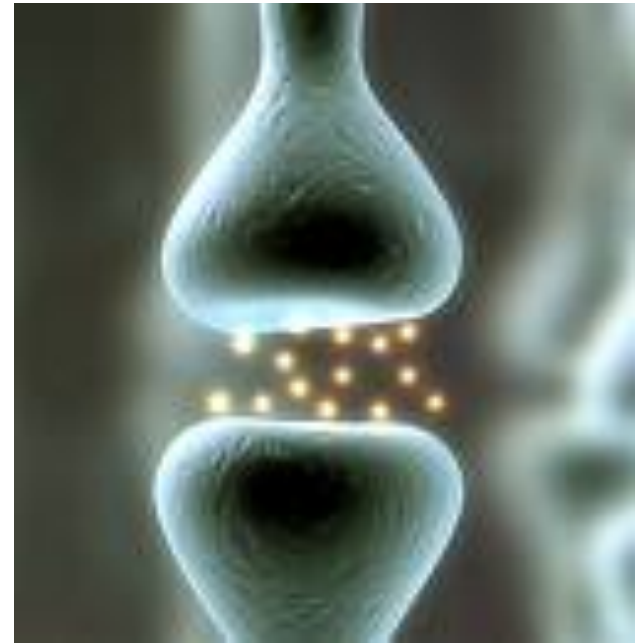
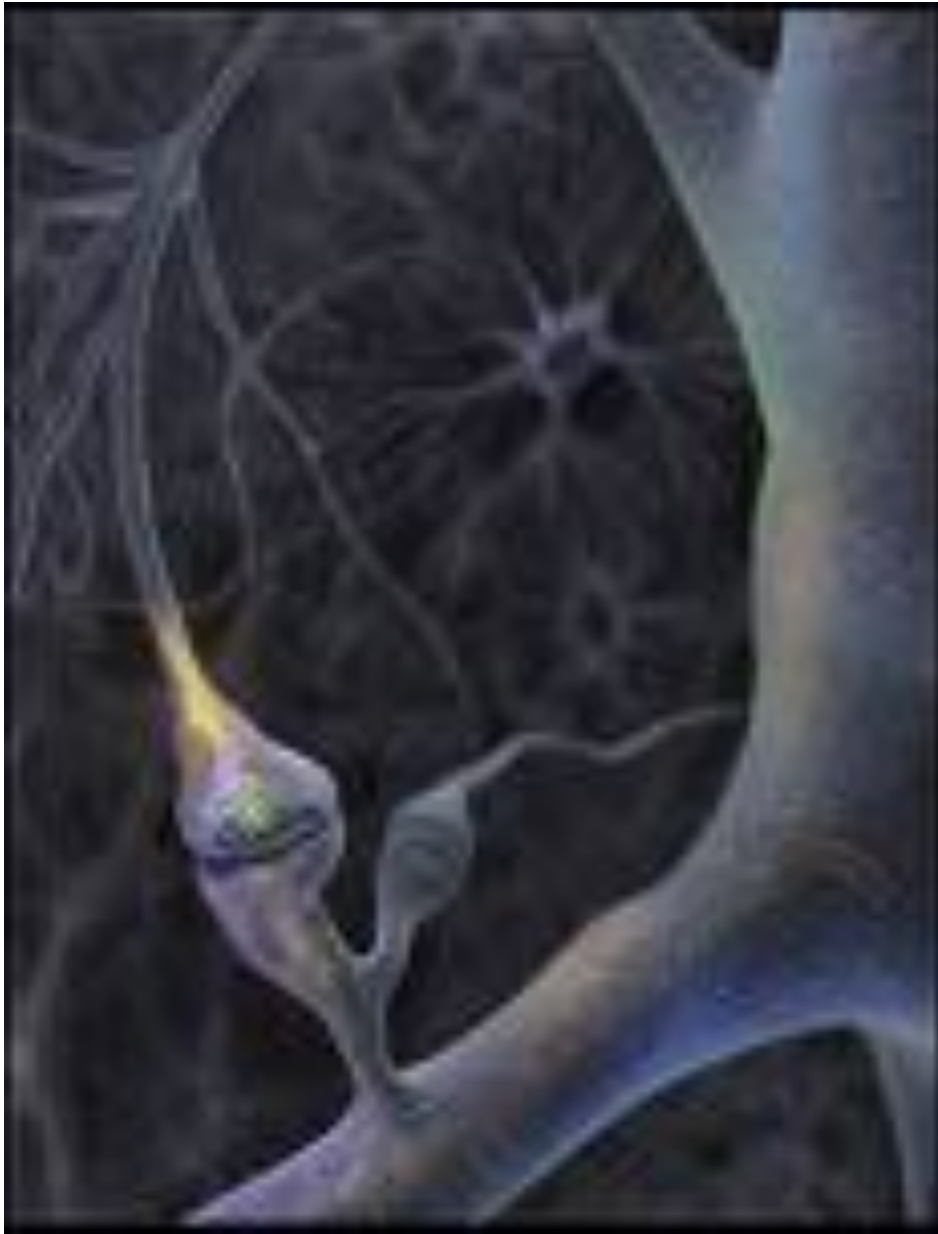
When Reading Emotion...

**Adults Rely More on the Frontal Cortex
While Teens Rely More on the Amygdala**



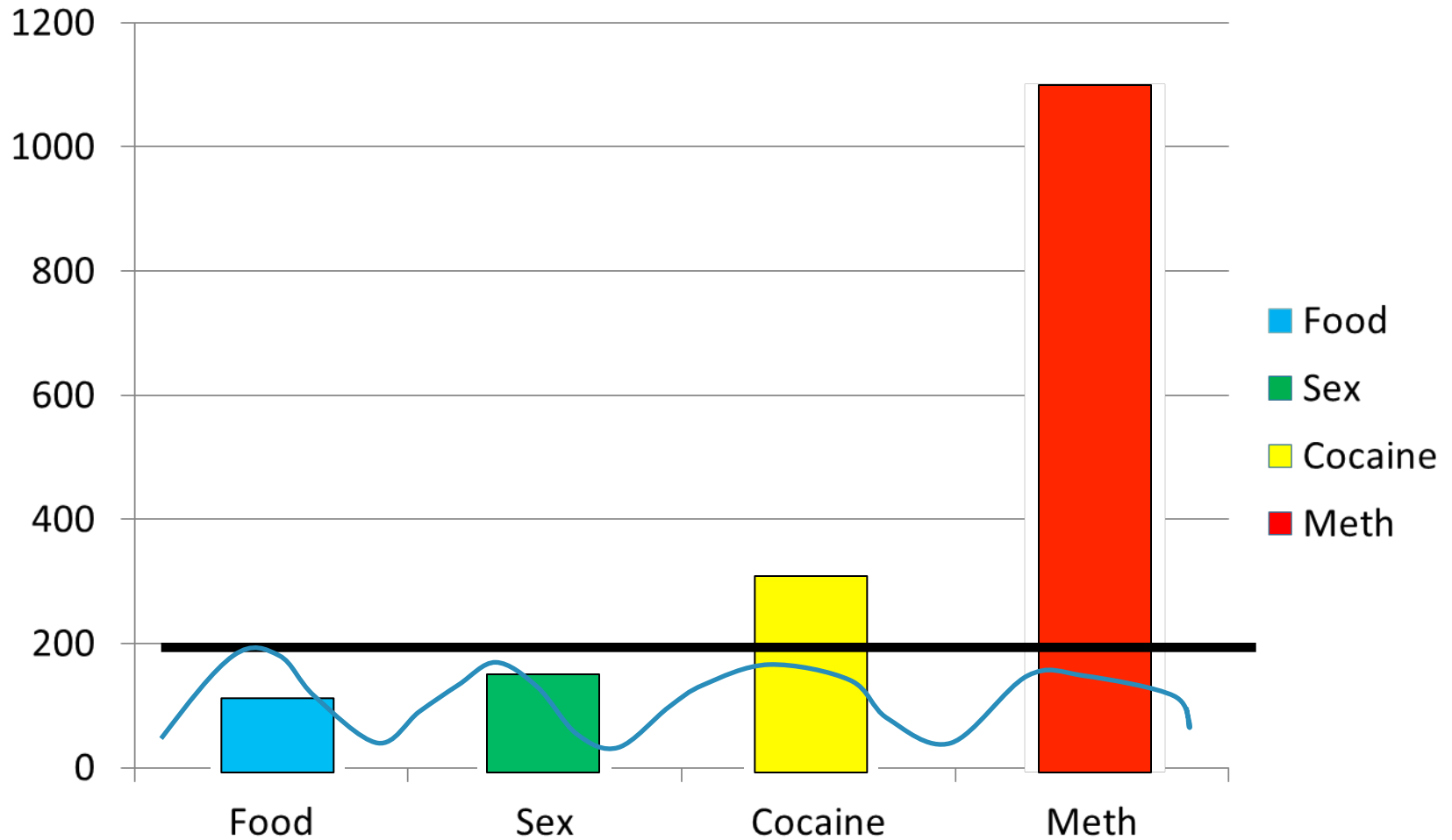
HYPOFRONTALITY



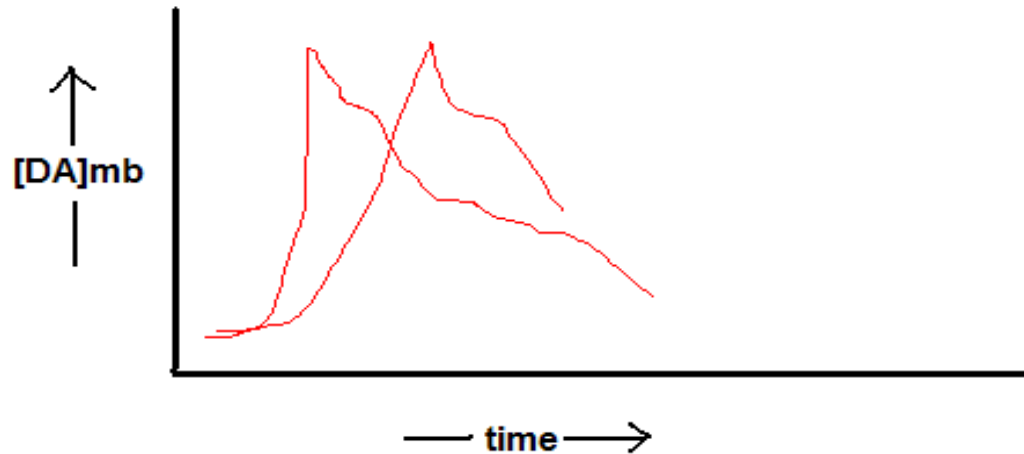


**Dopamine:
Calm, Happy, Signals
Salience**

Dopamine Release and the Hedonic (pleasure) Threshold

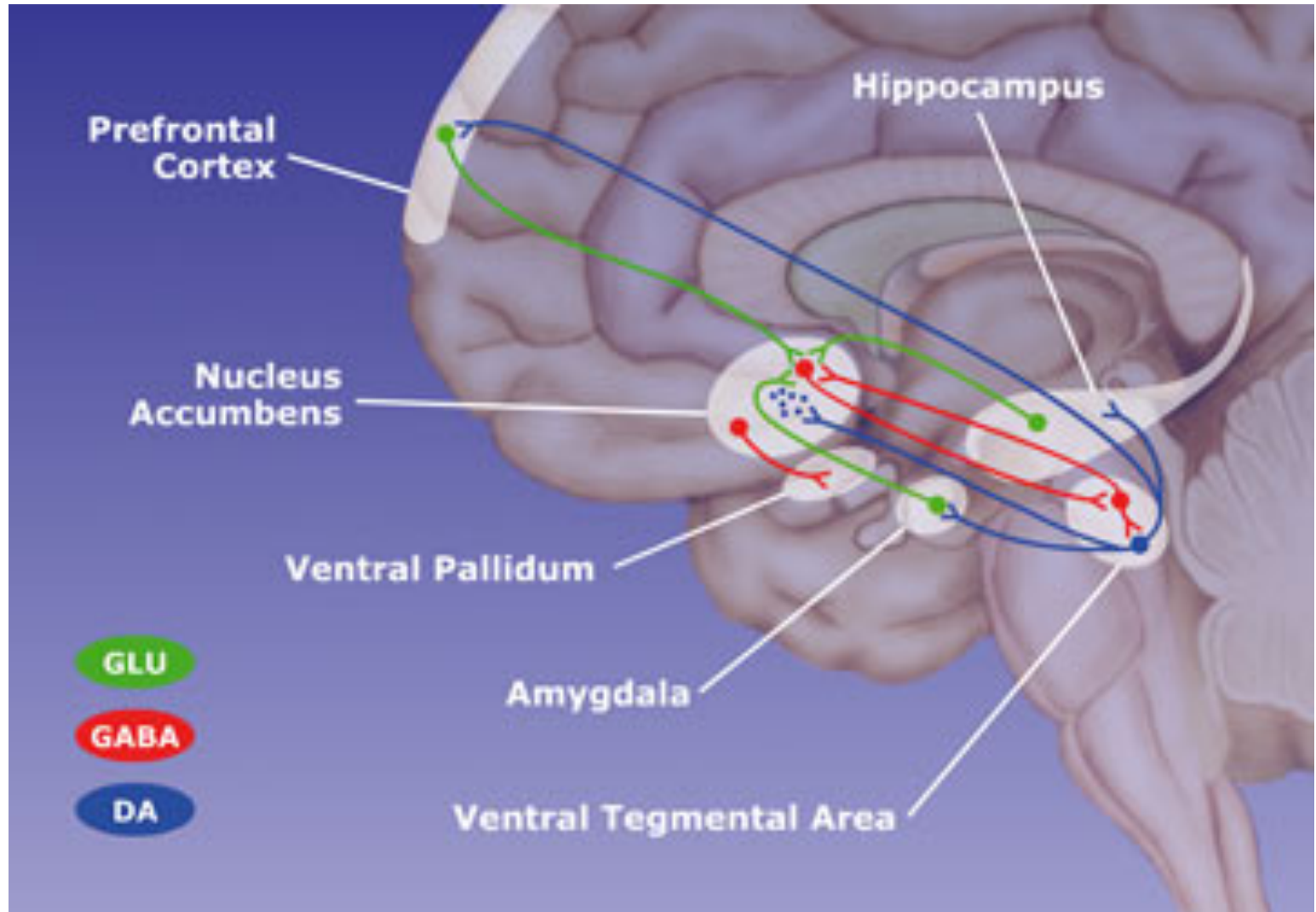


When Dopamine surges so does **Glutamate**

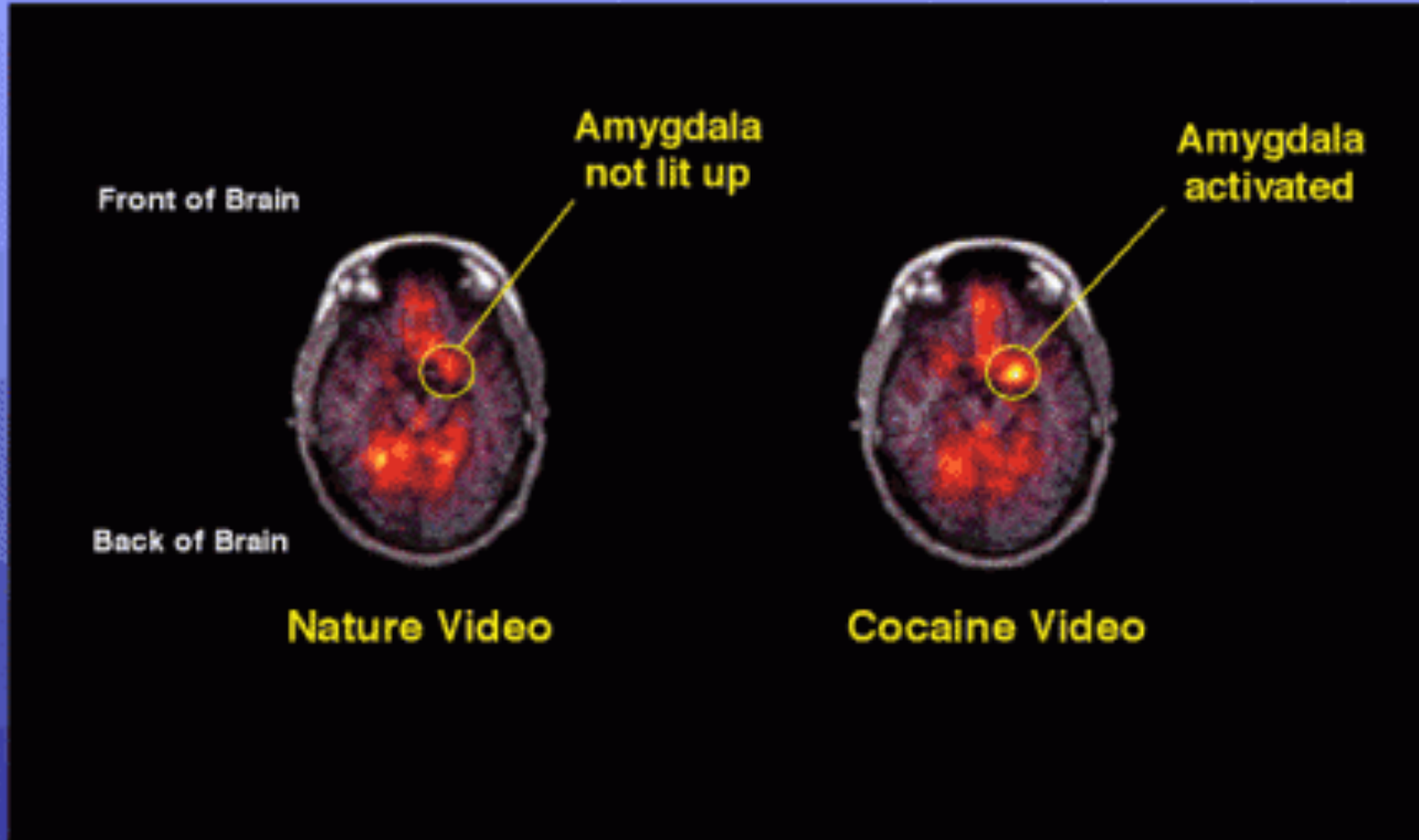


to form memories and create
motivation.

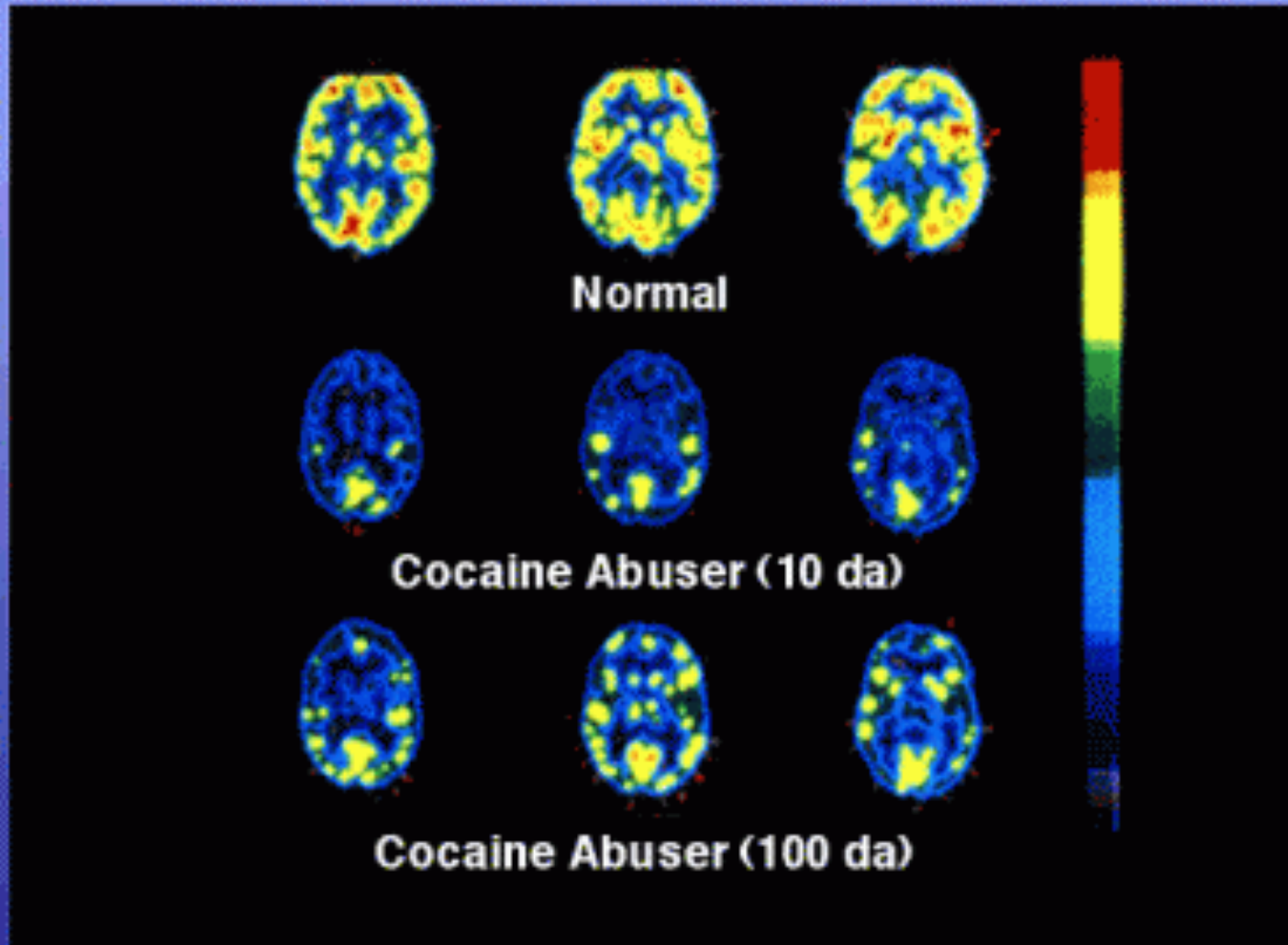
Reward Pathway



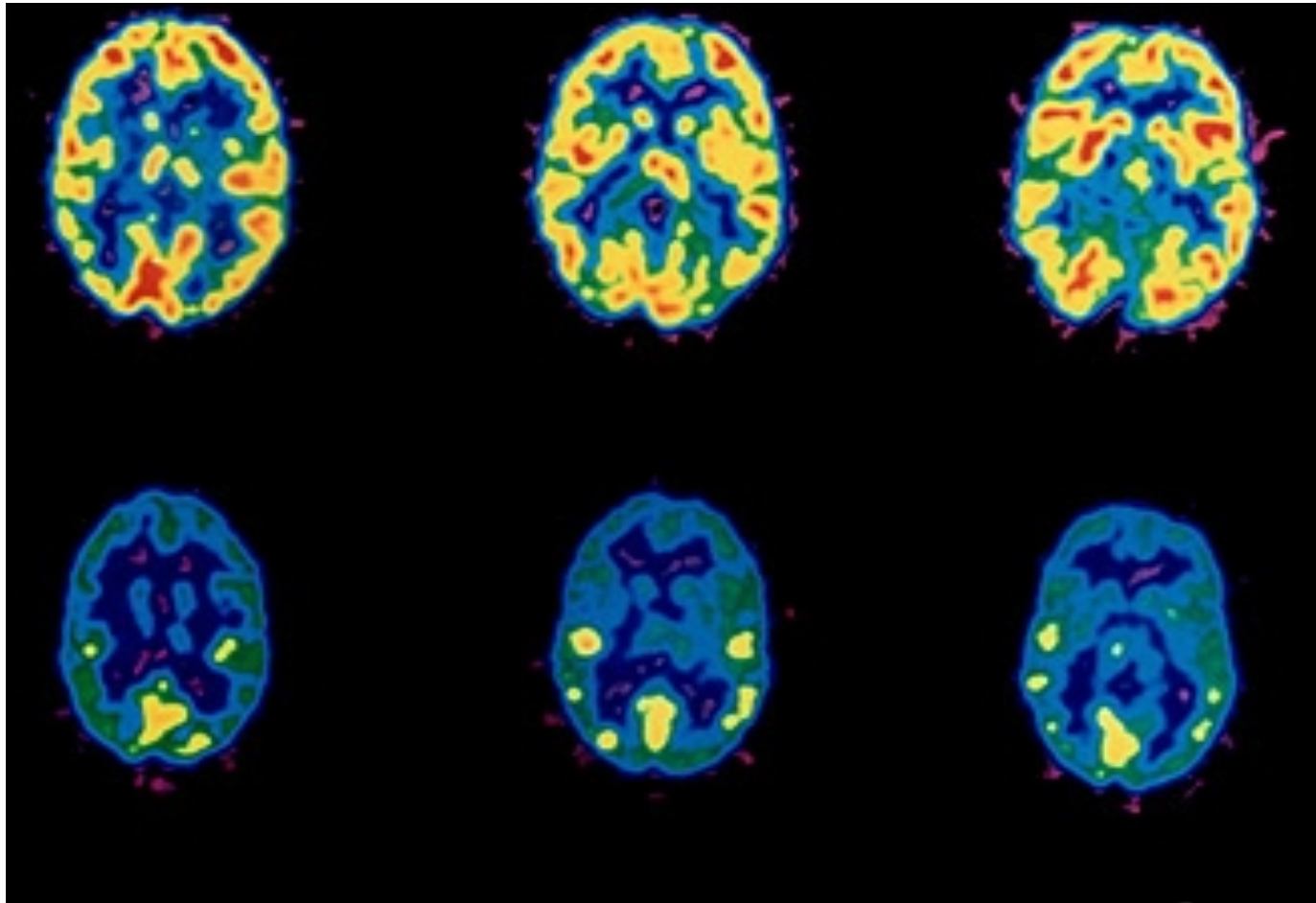
The Memory of Drugs



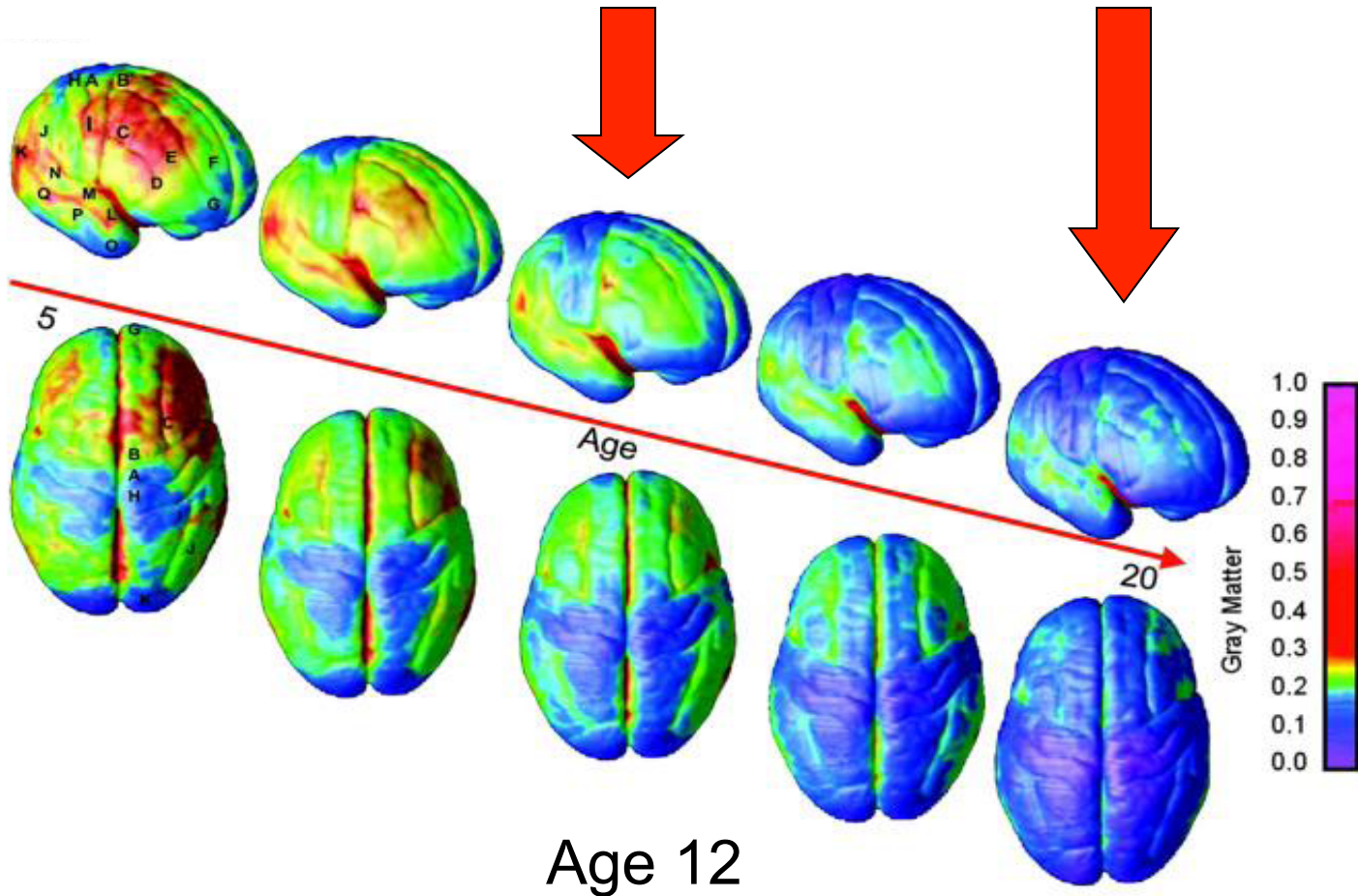
Your Brain After Drugs



HYPOFRONTALITY = ARREST



If you arrest here but stop using here



Copyright © 2004 The National Academy of Sciences, USA
Gogtay, N., Giedd, J.N., et al. (2004)

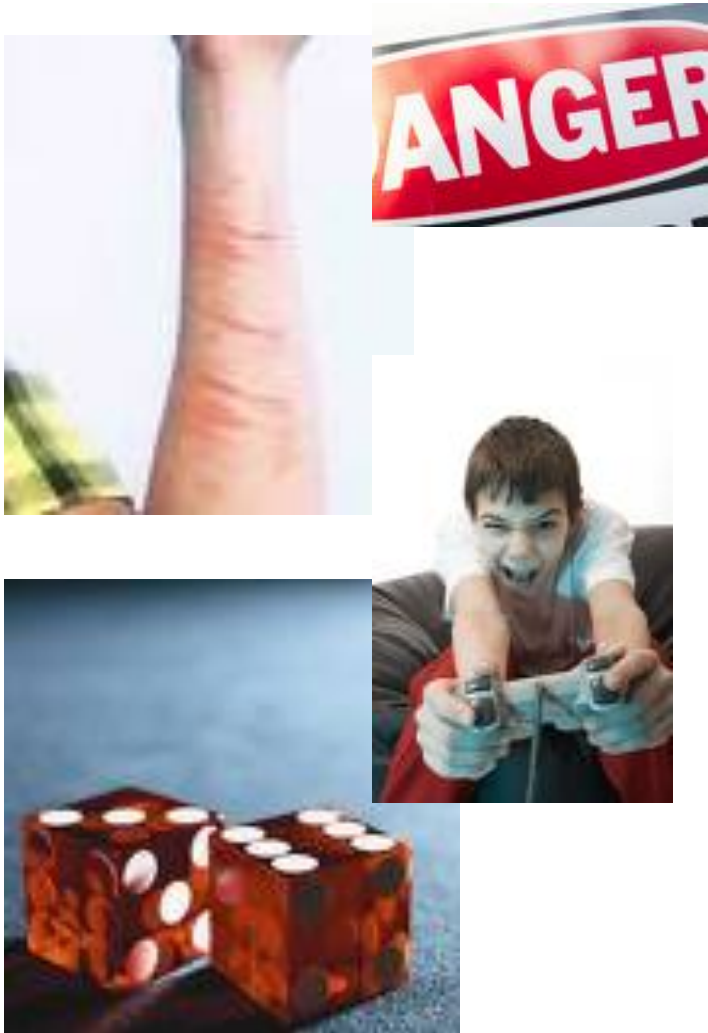
Dynamic mapping of human cortical development during childhood through early adulthood
Proceedings of the National Academy of Sciences, 101 (21), 8174 – 8179

Dopamine-Releasing Chemicals

- Alcohol & Sedative/Hypnotics
- Opiates/Opioids
- Cocaine
- Amphetamines
- Entactogens (MDMA)
- Entheogens/Hallucinogens
- Dissociants (PCP, Ketamine)
- Cannabinoids
- Inhalants
- Nicotine
- Caffeine
- Anabolic-Androgenic Steroids



Dopamine-Releasing Behaviors



- Food (Bulimia & Binge Eating)
- Sex
- Relationships
- Other People
("Codependency," Control)
- Gambling
- Cults
- Performance ("Work-aholism")
- Collection/Accumulation
("Shop-aholism")
- Rage/Violence
- Media/Entertainment

Prefrontal Cortex vs. Amygdala Thinking

- Abstract; conceptual understanding
 - Impulse Control
 - Problem-Solving
 - Decision-Making
 - Judgment
 - Emotion Regulation
 - Frustration Tolerance
 - Ability to Feel Empathy
- ◆ All or Nothing: Concrete
 - ◆ Based on fear or anger reactions
 - ◆ Ignited by real or perceived threats
 - ◆ Begins adrenaline cycle
 - ◆ Fight or Flight Survival Mode

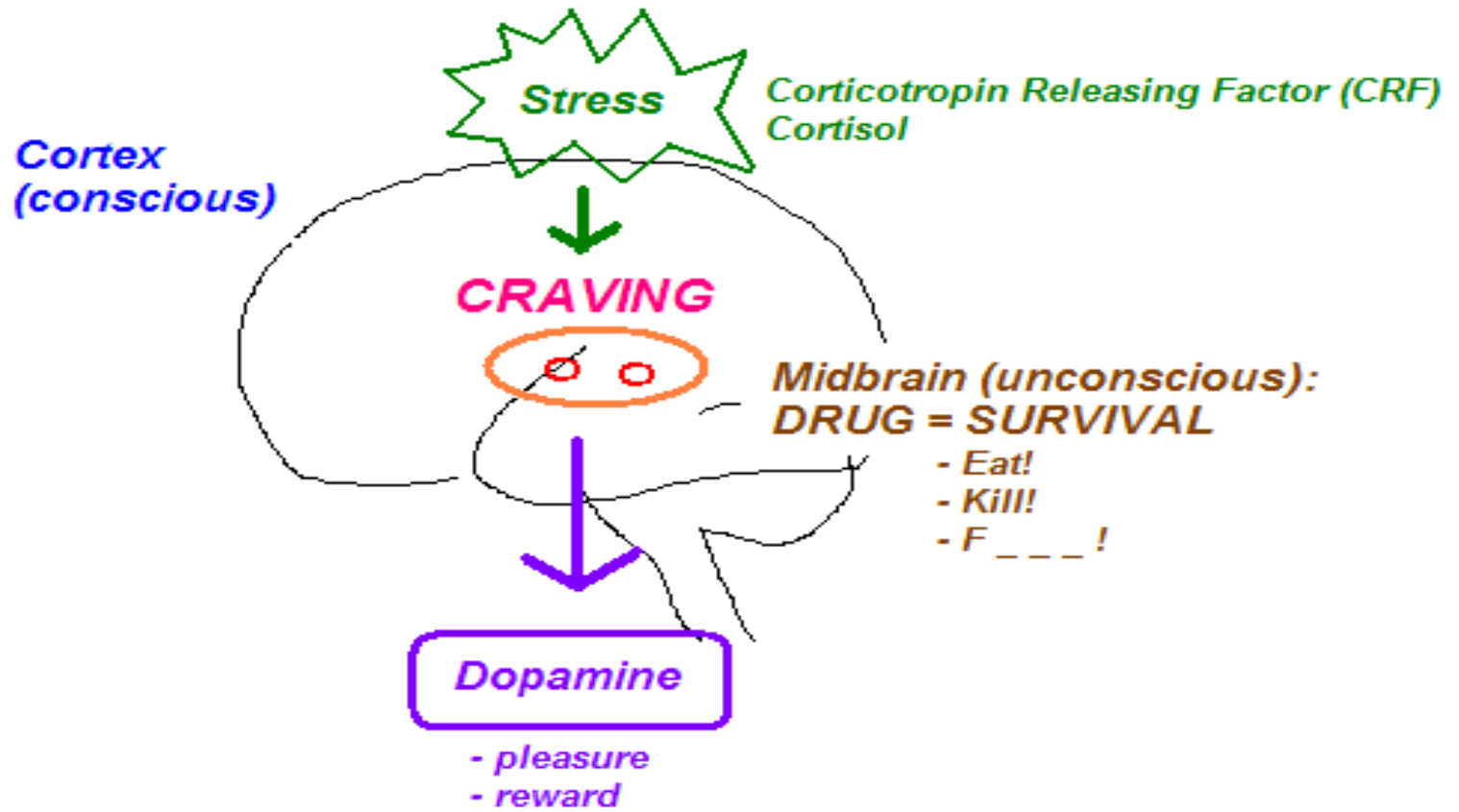
Causes of Arrested Development

- Chemical Use
- Trauma
- Intense Emotions – Anger, Fear
- Overindulgence
- Stress
- Amygdala Never Forgets



Hypercortisolemia

STRESS = ↑CORTISOL = ↓DOPAMINE = Anhedonia (Pleasure Deafness)



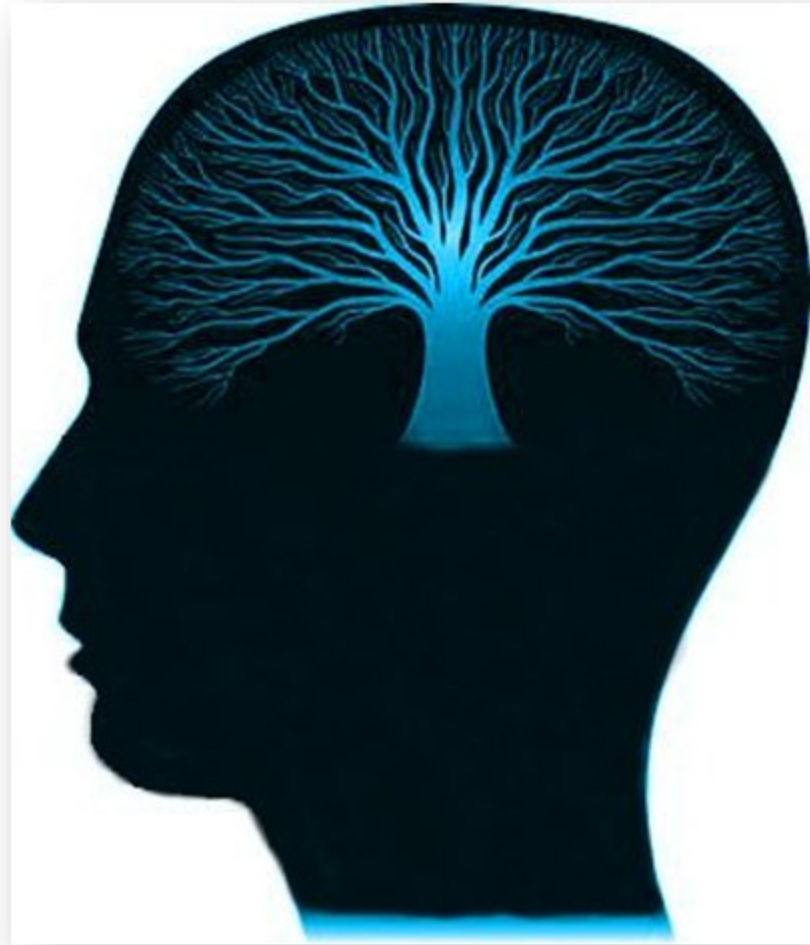
Acquired Narcissism



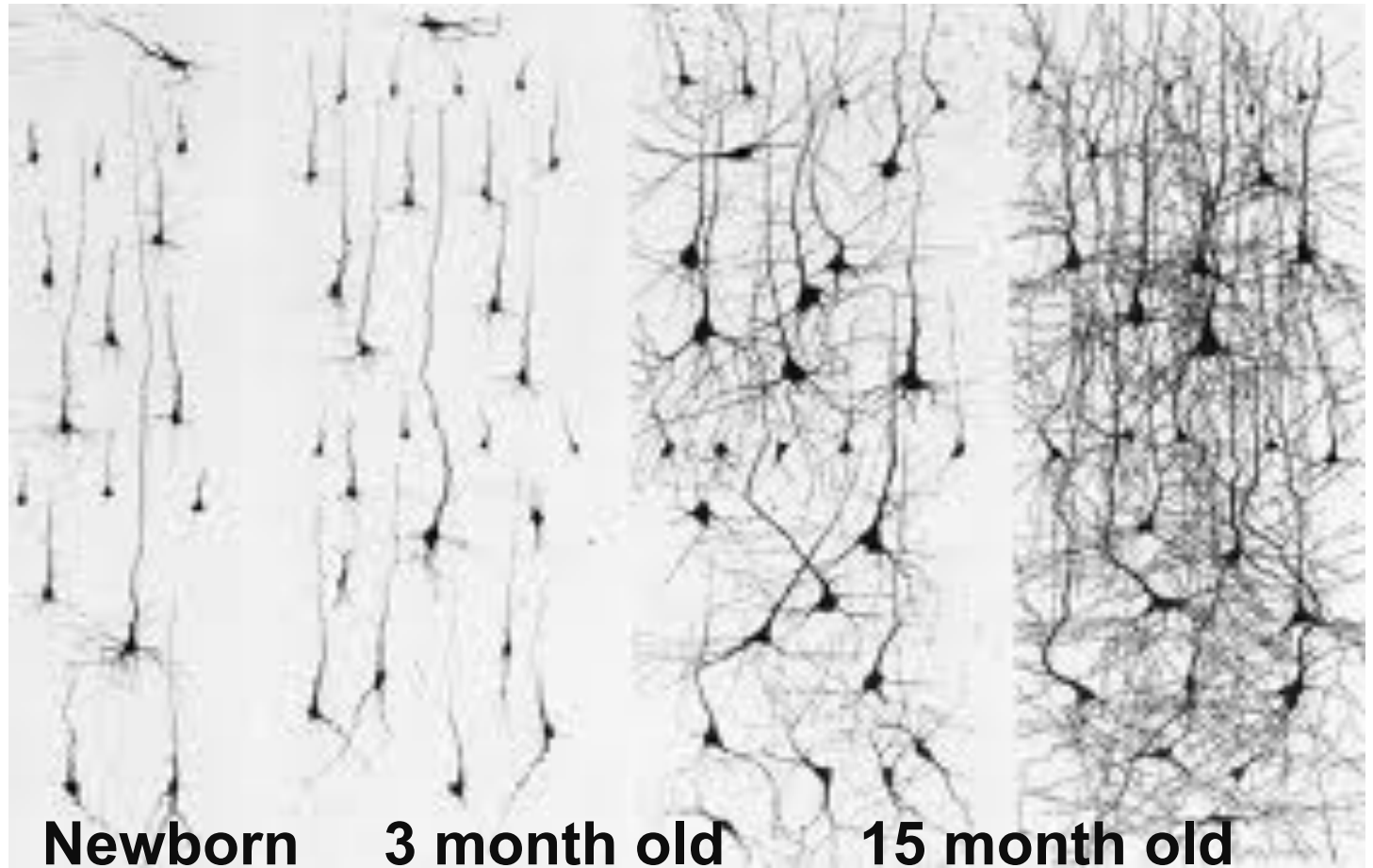
- Poor attunement
- Inadequate self-appraisal
- Little capacity for reflection
- Projections dominate
- Poor impulse control
- Focus on self to compensate
- Emotional extremes
- Denial

Neuroplasticity & Recovery

Recovery
is
Brain
Rehabilitation



Our brain can restructure itself based on our experience



“My experience is what I agree to attend to. Only those items which I notice shape my mind.”

William James, American psychologist

Our Neural Networks Continue to Build Until We Die

- The more often neural pathways fire, the stronger the connections will become.
- “Neurons that fire together wire together.”

Donald Hebb
Canadian
Psychologist



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