

Brain Health, Healing and Physical Fitness



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We would like to acknowledge and pay our deep respect to the past, present and future Traditional Owners and Elders of this nation and the continuation of cultural, spirituality, family, community and educational practices of Aboriginal and Torres Strait Islander peoples.

We would also like to extend that respect to any Aboriginal and Torres Strait Islander peoples here today.



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Social Problem we are addressing

The decrease in brain health amongst affected people and communities.

Our Mission

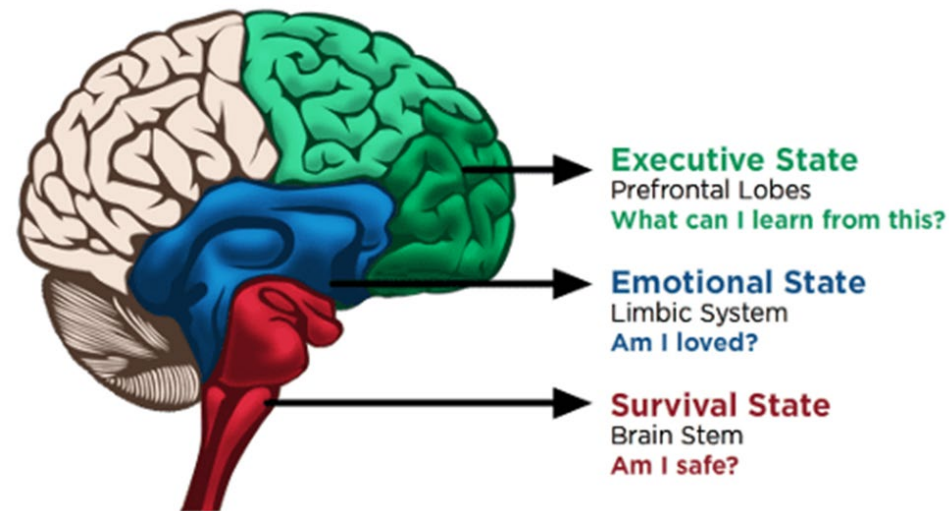
Yiliyapinya improves brain health in a culturally responsive and contextualised way using tailored neuroplasticity impact programs.



How do we help people move from surviving to thriving?

Brain Health, Healing and Physical Fitness

1. Understand your brain so that you can understand others.
2. Teach others about their brain and the power of neuroplasticity.
3. Co-regulate and teach how to change Brain Stem and Limbic reactivity through culture and connection.
4. Strengthen Pre-frontal Cortex (cognitive skills).





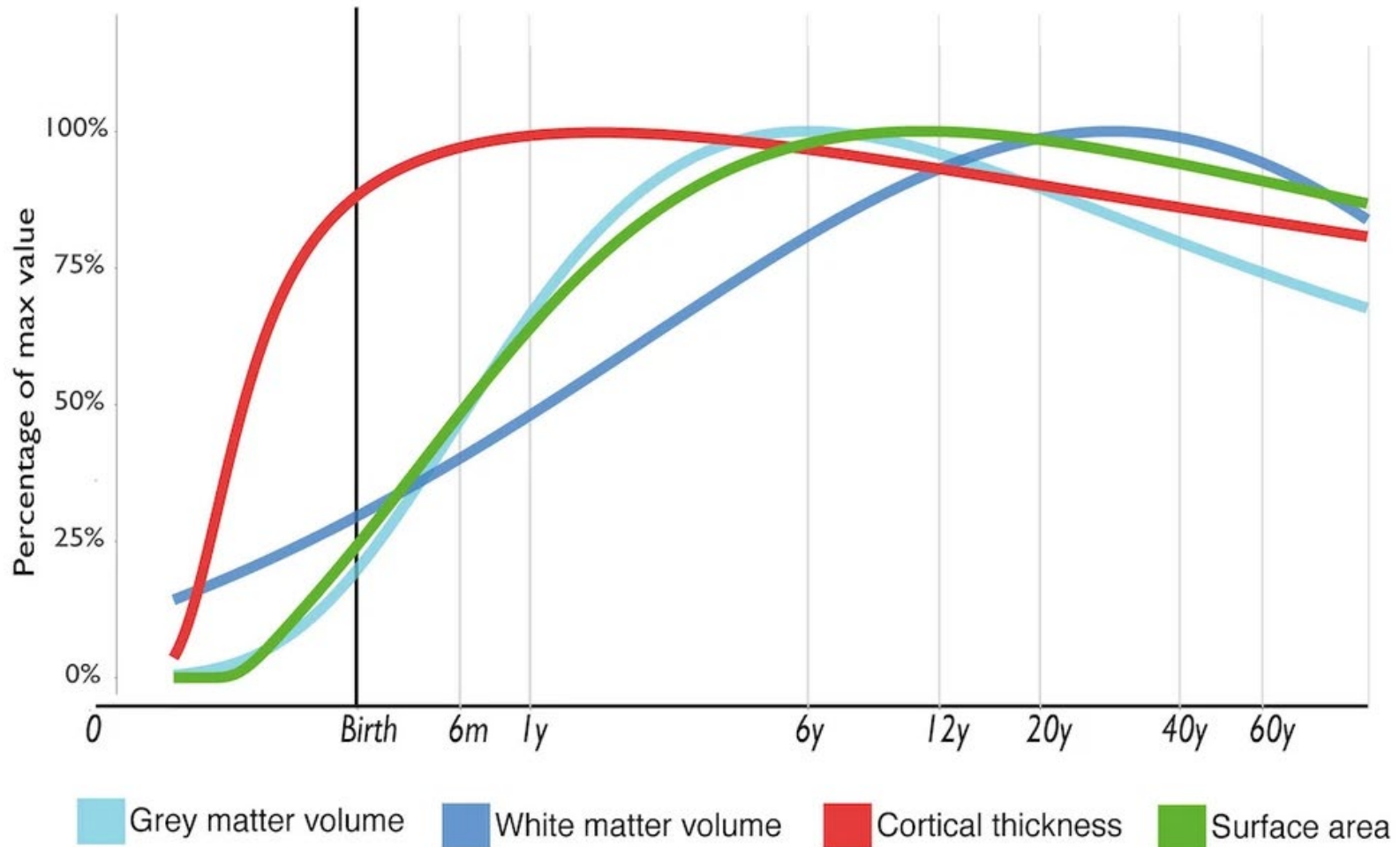
Brain Health

Brain health refers to the overall well-being of the brain, including its ability to function optimally and maintain its physical, chemical, and biological balance.



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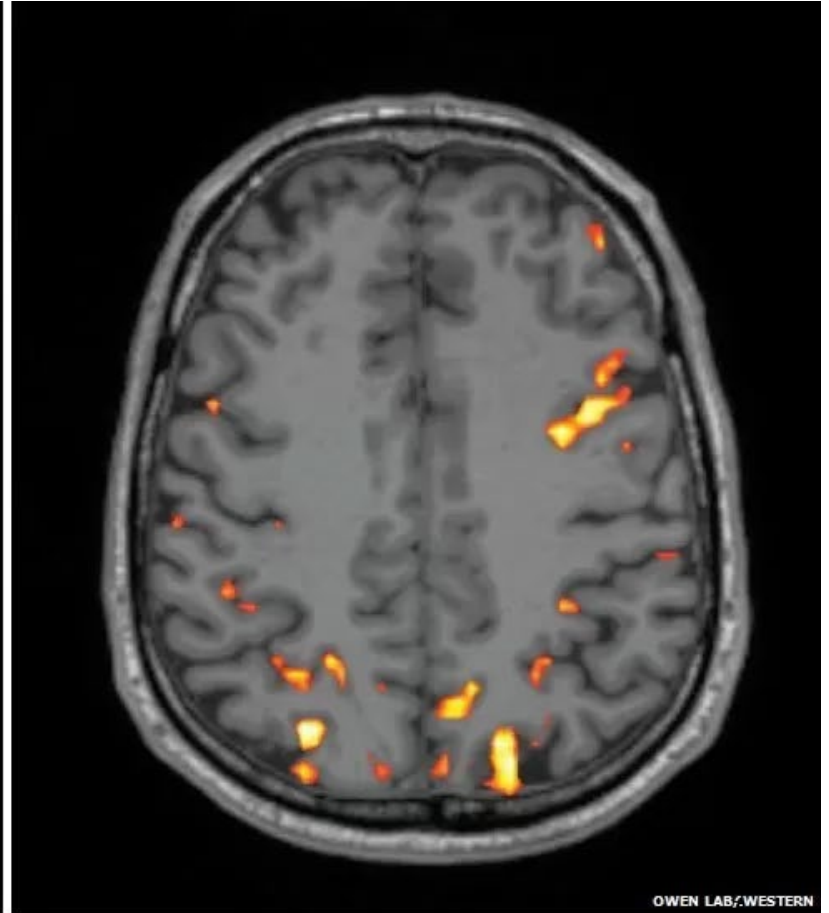
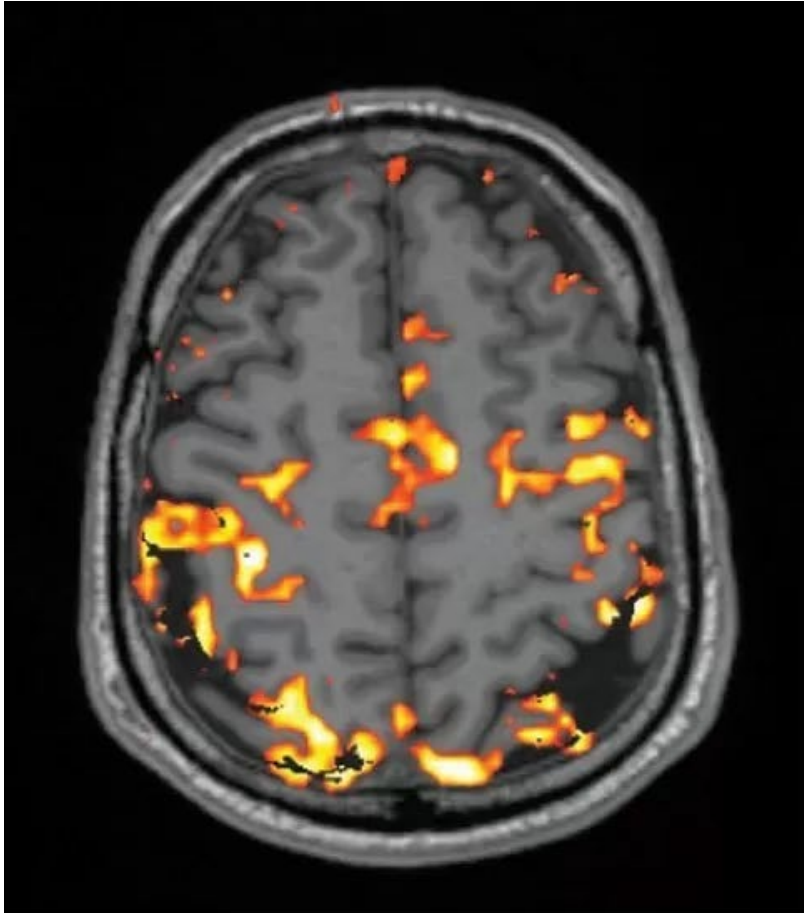
Brain Health across the Lifespan



Graph showing the rapid growth of the brain in infancy © Bethlehem, RAI, Seidlitz J & White, SR et al © Bethlehem, RAI, Seidlitz J & White, SR et al

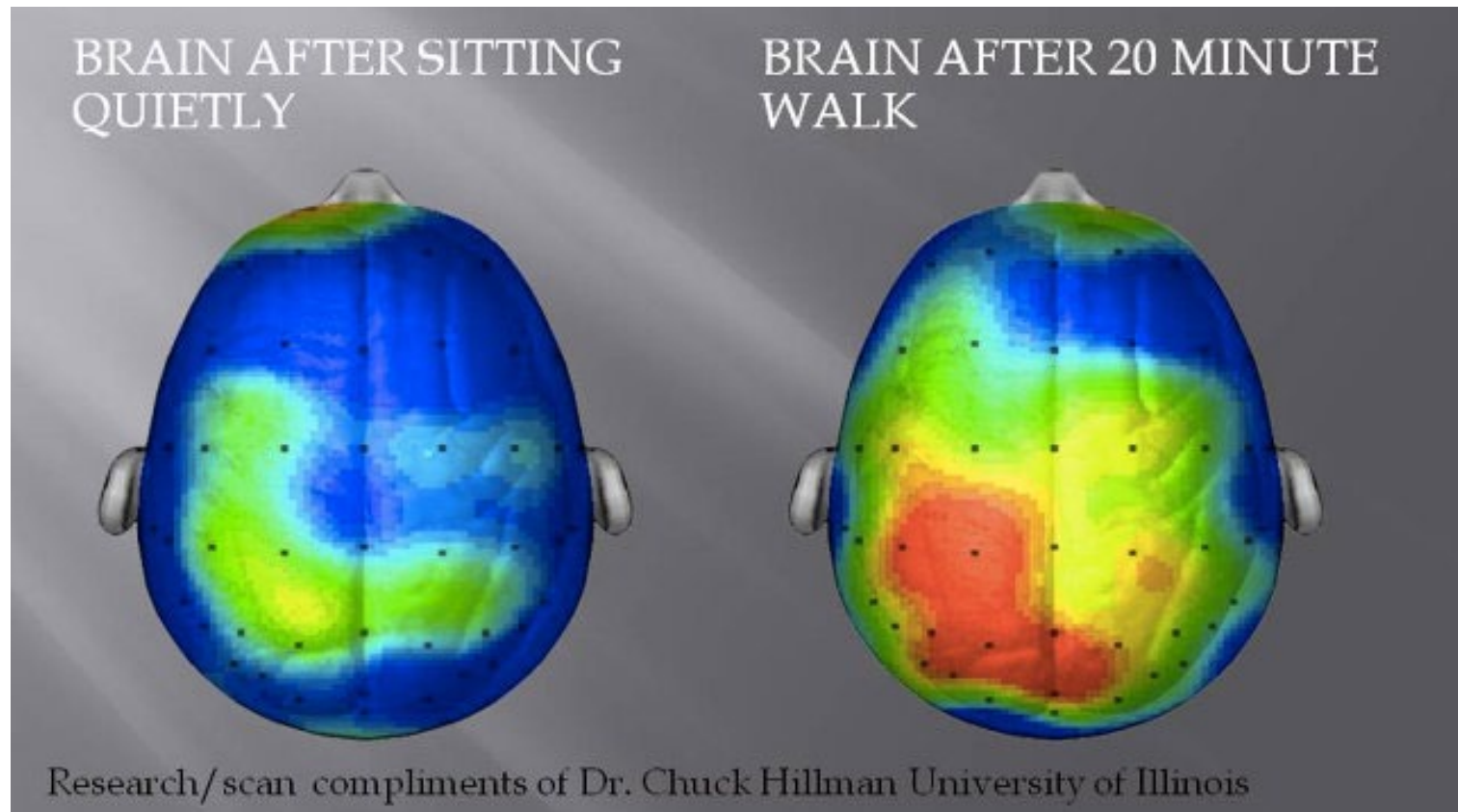


Sleep and cognition



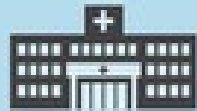
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Physical exercise



Nutrition

Can eating a ketogenic diet improve symptoms of serious mental illness?

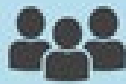


Clinique du Castelvieu
Castelmarou, France

28
inpatients



Bipolar disorder
n=12

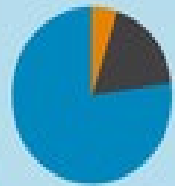


Major depression
n=6



Schizophrenia
n=10

Ketogenic Diet



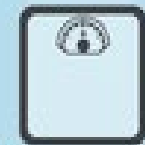
75-80% fat
15-20% protein
5% carbohydrate



43%
achieved
clinical
remission



symptoms
improved in
100%
of patients



96%
of patients
lost weight



64%
of patients
were discharged
on **less** medication

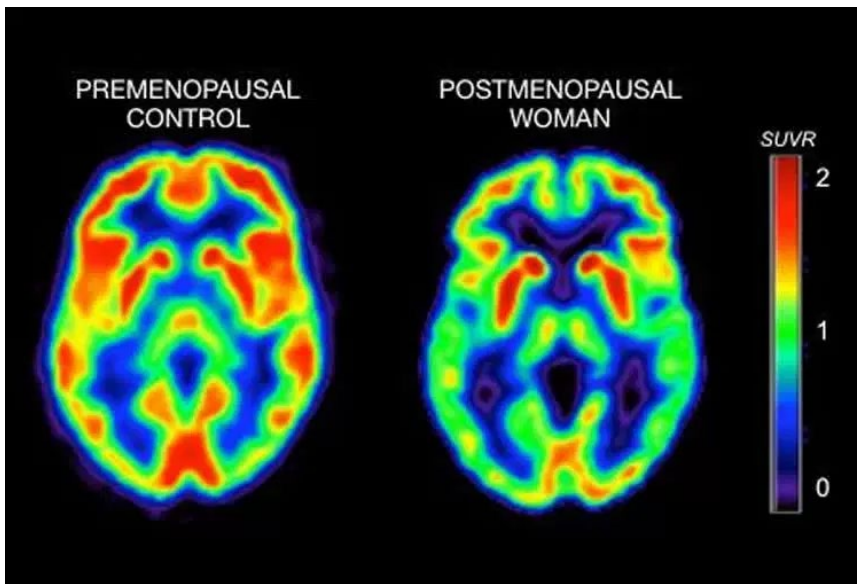
The Ketogenic Diet for Refractory Mental Illness: A Retrospective Analysis of 31 Inpatients
Albert Dinan MD, Eric C Westman MD, Laura R Sotlow PhD, Georgia Eide MD

Frontiers in Psychiatry, Public Mental Health 06 July 2022; <https://doi.org/10.3389/fpsyt.2022.951376>
Graphic designed by Suzi Smith

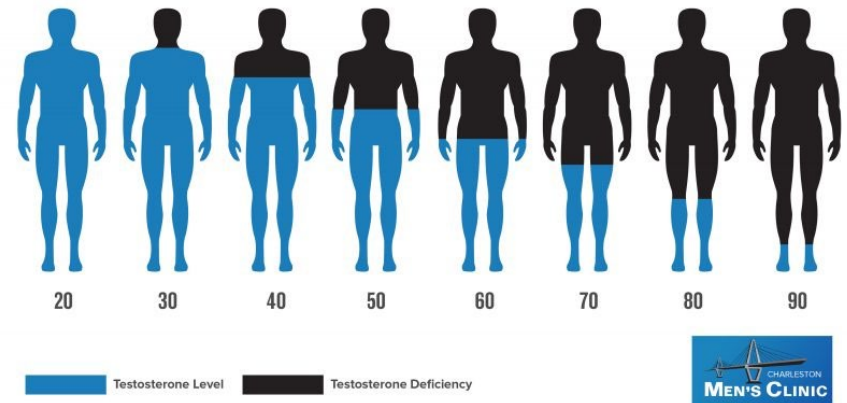


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Hormones



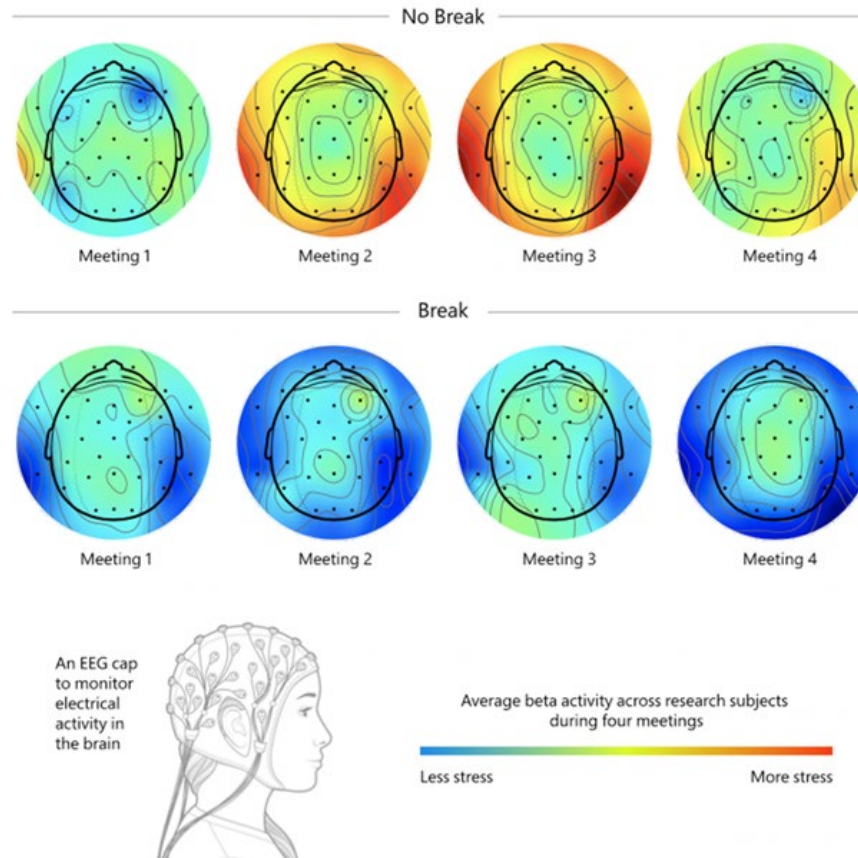
MALE TESTOSTERONE PRODUCTION WITH AGE



Give your brain a cognitive break

Your brain works differently when you take breaks

Taking time out between video calls prevents stress from building up.



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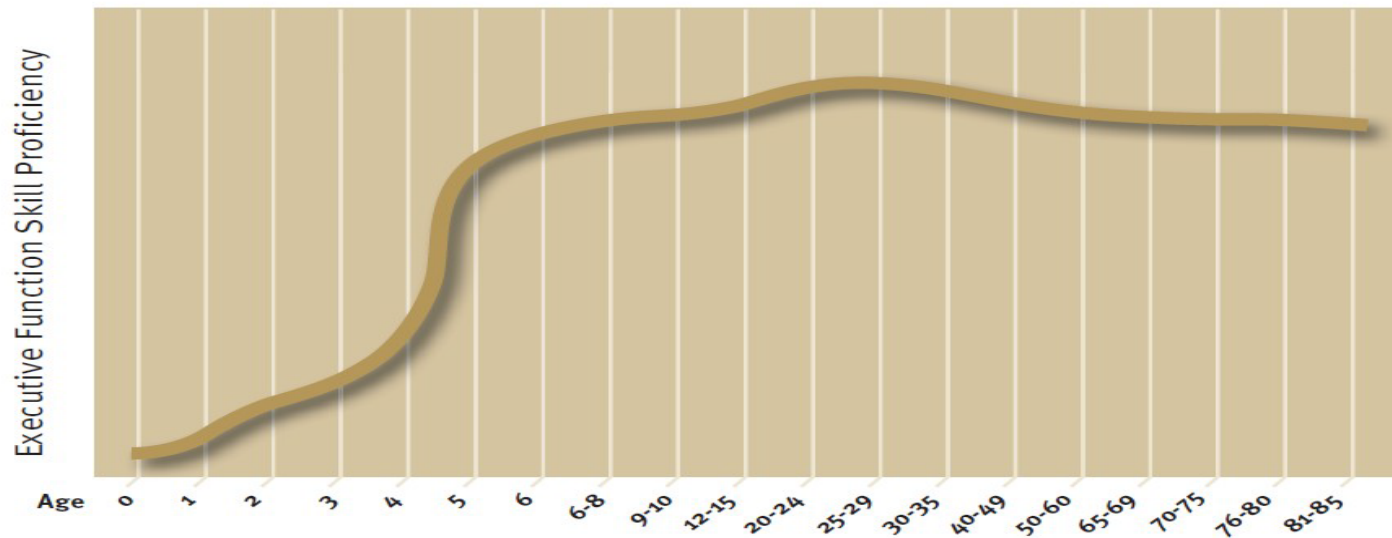
Across the lifespan – Executive Function

Working Memory

Inhibition Control

Cognitive Flexibility

Executive Function Skills Build Throughout Childhood and Adolescence



A range of tests measuring different forms of executive function skills indicates that they begin to develop shortly after birth, with ages 3 to 5 providing a window of opportunity for dramatic growth in these skills. Growth continues throughout adolescence and early adulthood; proficiency begins to decline in later life.

Source: Weintraub et al. (In Press).⁹⁹



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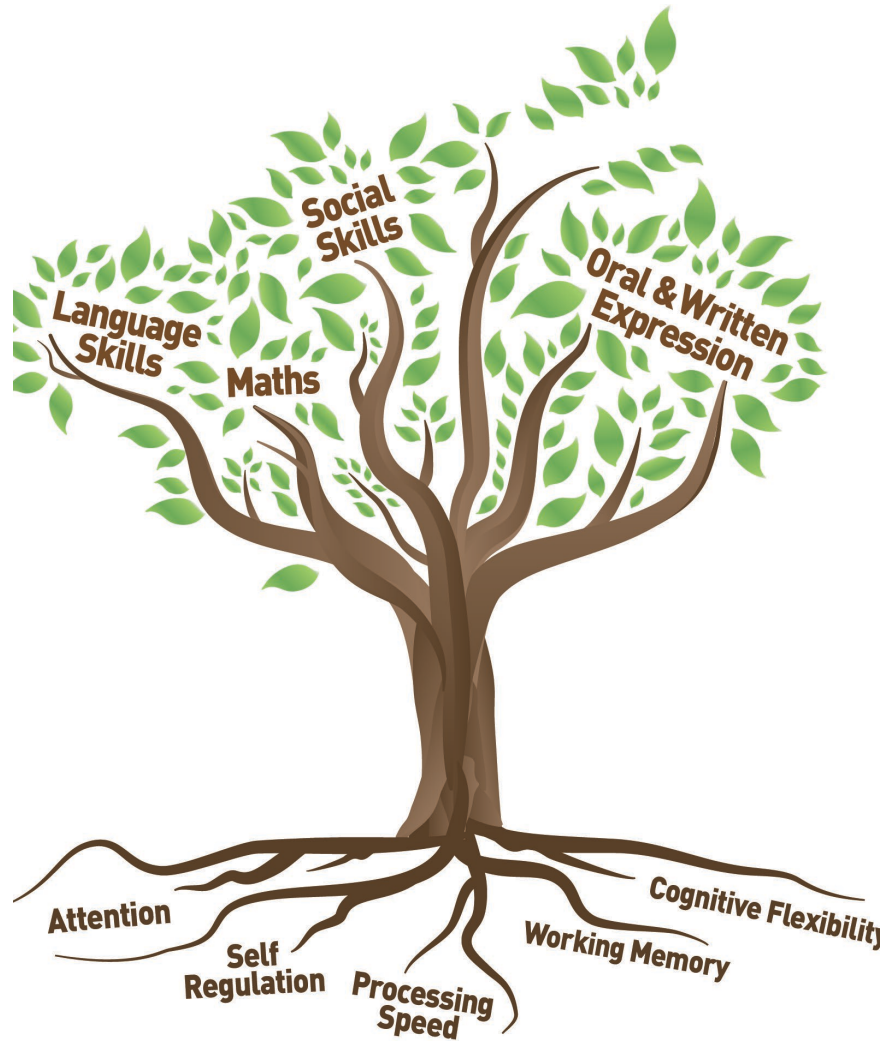
Executive Functions are important for life outcomes

Table 1 Executive functions (EFs) are important to just about every aspect of life

Aspects of life	The ways in which EFs are relevant to that aspect of life	References
Mental health	EFs are impaired in many mental disorders, including:	
	- Addictions	Baler & Volkow 2006
	- Attention deficit hyperactivity (ADHD)	Diamond 2005, Lui & Tannock 2007
	- Conduct disorder	Fairchild et al. 2009
	- Depression	Taylor-Tavares et al. 2007
	- Obsessive compulsive disorder (OCD)	Penadés et al. 2007
	- Schizophrenia	Barch 2005
Physical health	Poorer EFs are associated with obesity, overeating, substance abuse, and poor treatment adherence	Crescioni et al. 2011, Miller et al. 2011, Riggs et al. 2010
Quality of life	People with better EFs enjoy a better quality of life	Brown & Landgraf 2010, Davis et al. 2010
School readiness	EFs are more important for school readiness than are IQ or entry-level reading or math	Blair & Razza 2007, Morrison et al. 2010
School success	EFs predict both math and reading competence throughout the school years	Borella et al. 2010, Duncan et al. 2007, Gathercole et al. 2004
Job success	Poor EFs lead to poor productivity and difficulty finding and keeping a job	Bailey 2007
Marital harmony	A partner with poor EFs can be more difficult to get along with, less dependable, and/or more likely to act on impulse	Eakin et al. 2004
Public safety	Poor EFs lead to social problems (including crime, reckless behavior, violence, and emotional outbursts)	Broidy et al. 2003, Denson et al. 2011



Why are Cognitive Skills important?



Short Term Memory

<https://faculty.washington.edu/chudler/stm0.html>



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Attention Matters

AT T **EN** J  O N



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What are some common cognitive skills?

- Attention: The ability to focus and sustain attention on a task or information for a certain period.
- Perception: The ability to interpret and understand sensory information, such as visual and auditory input.
- Memory: The ability to encode, store, and retrieve information over time.
- Reasoning: The ability to draw conclusions from information, make logical deductions, and identify patterns and relationships.
- Attention to detail: The ability to notice and attend to small details and discrepancies in information.
- Spatial awareness: The ability to understand and navigate the physical space and environment.
- Planning and organization: The ability to plan and organize tasks, resources, and time effectively.



Relationships Matter

Buffer – Reset – Repair the brains sensitivity to stress and adversity.

A nurturing adult is a critically important resilience factor for people, turning potentially toxic stress into tolerable stress.

S T R E S S R E S P O N S E		
POSITIVE	TOLERABLE	TOXIC
Physiological response to mild or moderate stressor	Adaptive response to time-limited stressor	Maladaptive response to intense and sustained stressor
Brief activation of stress response elevates heart rate, blood pressure, and hormonal levels	Time-limited activation of stress response results in short-term systemic changes	Prolonged activation of stress response in children disrupts brain architecture and increases risk of health disorders
Homeostasis recovers quickly through body's natural coping mechanisms	Homeostasis recovers through buffering effect of caring adult or other interventions	Prolonged allostasis establishes a chronic stress response
<i>Tough test at school, playoff game</i>	<i>Immigration, natural disaster</i>	<i>Abuse, neglect, household dysfunction</i>



Cognitive Desensitisation

- Involves a decrease in emotional responsiveness or sensitivity to emotional stimuli.
- Reduced emotional response: feeling emotionally numb, indifferent, or detached.
- Increased emotional numbing or disconnection
- Difficulty with empathy
- Avoidance behavior
- It is important to note that cognitive desensitization is often a coping mechanism for individuals who have experienced trauma or repeated exposure to emotional stressors.



Common influences of Brain Health

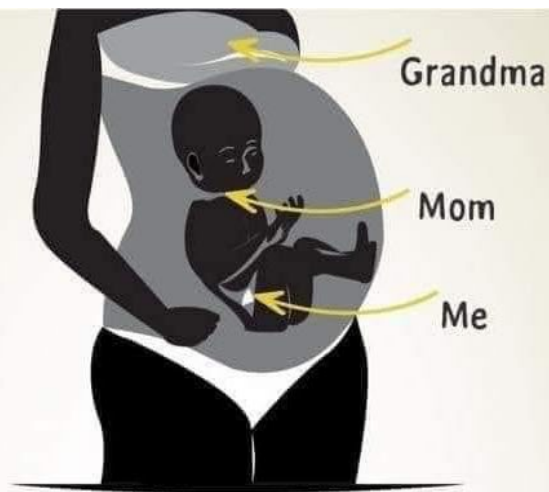


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We are not born
a blank slate



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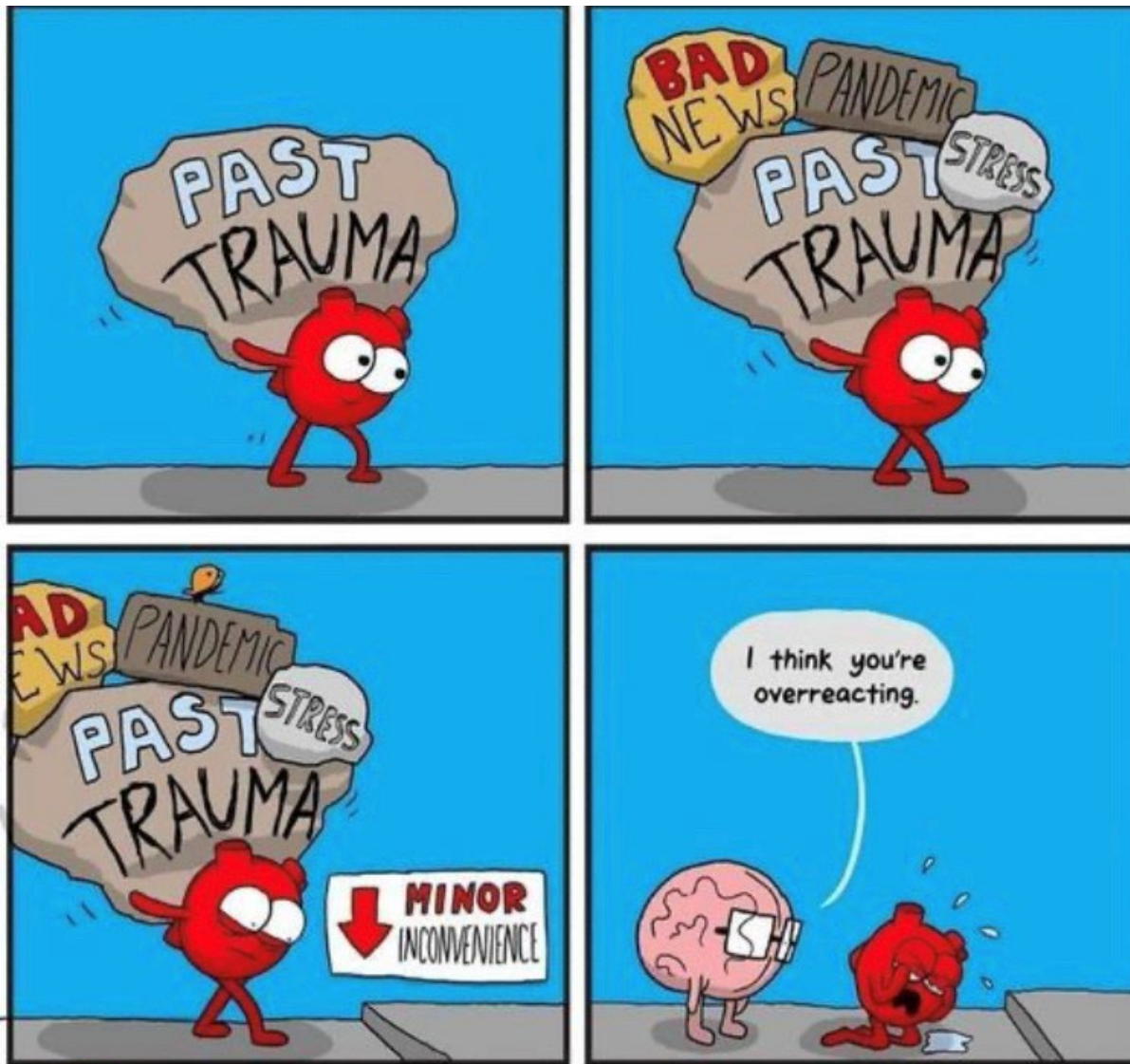
This is so amazing..
Did you know that your
grandmother carried part
of you inside her womb?
But how? Well, a female fetus
is born with all the eggs she
will ever have in her lifetime.
So when your Grandmother was
carrying your Mother in her womb.
You were a tiny egg in your
Mother's ovaries.
The three of you have been
connected for a very long time
Women are amazing!

DEMIC



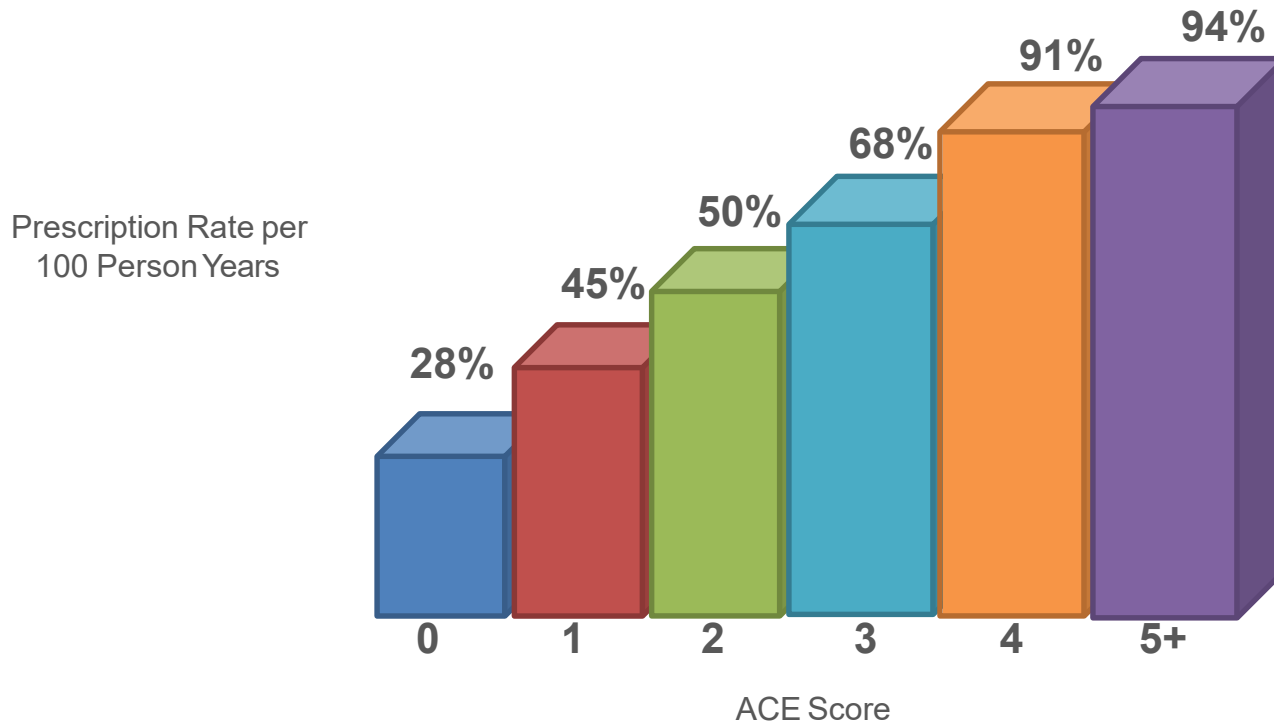
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Intergenerational Trauma



ACE Study

ACE Score and Rates of Antidepressants



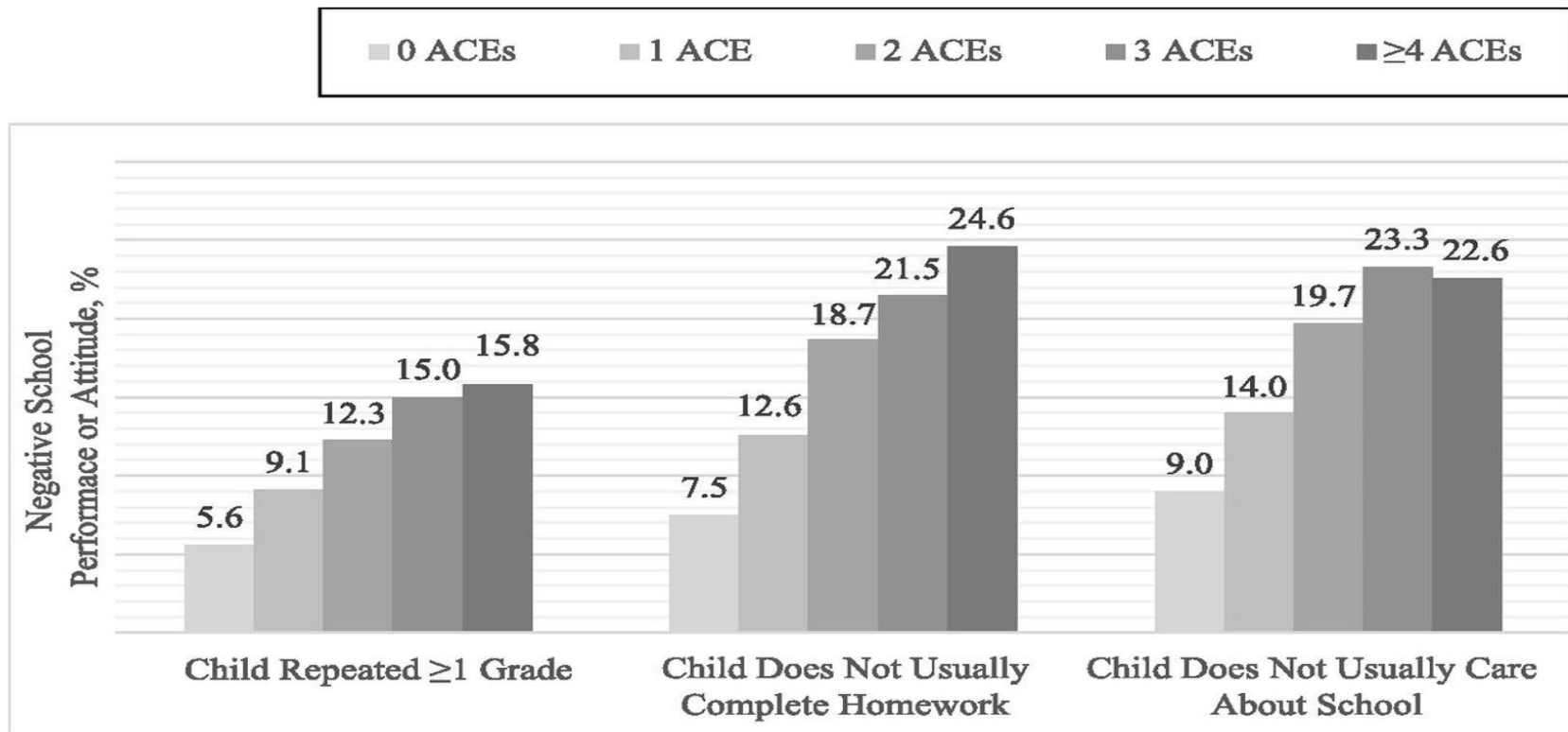
Mental Health Costs



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ACEs and Toxic Stress - School Performance

Prevalence of negative school performance and attitude outcomes by number of ACEs among children ages 6 to 17 (2011–2012 NSCH).

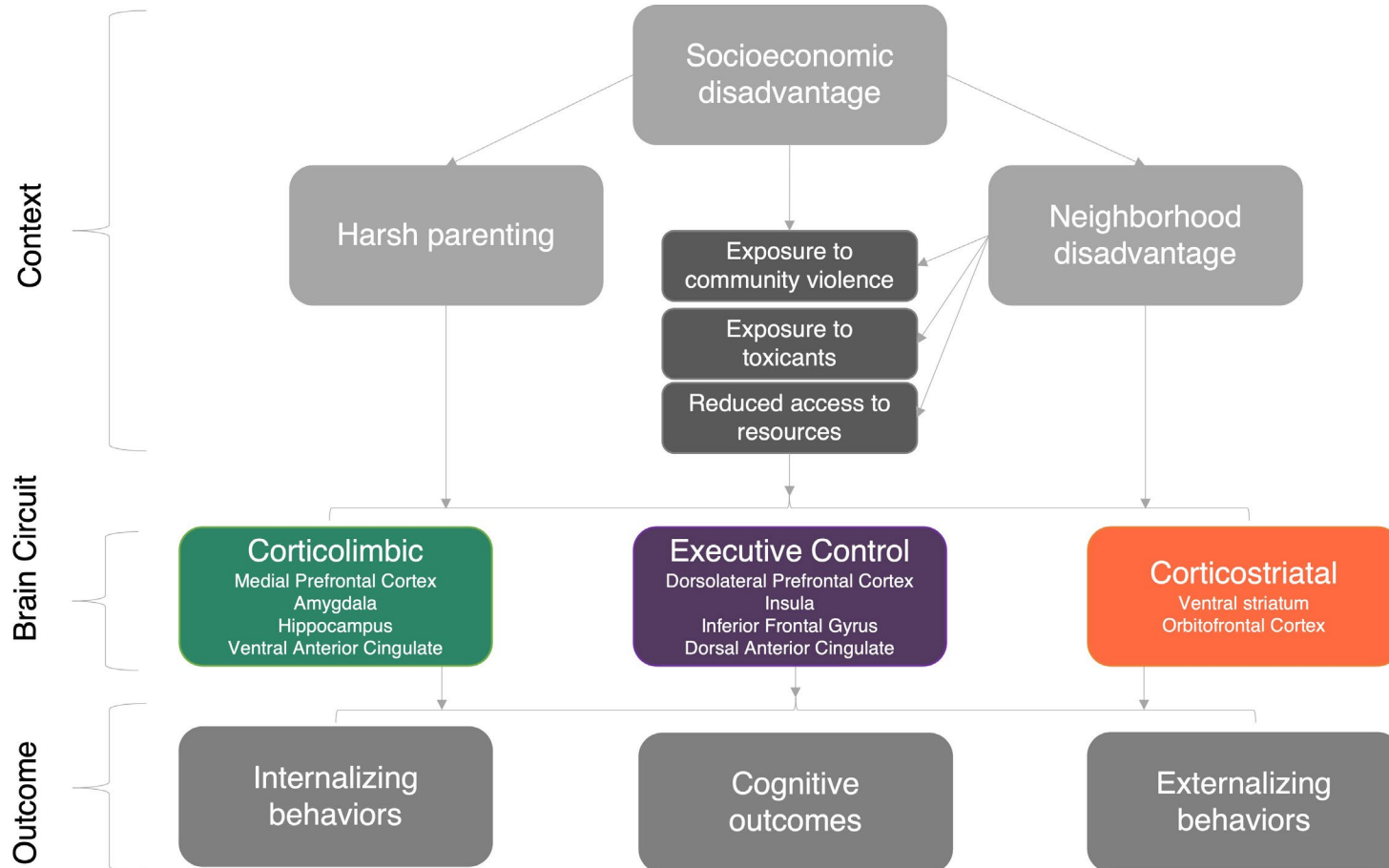


Angelica Robles et al. Pediatrics 2019;144:e20182945

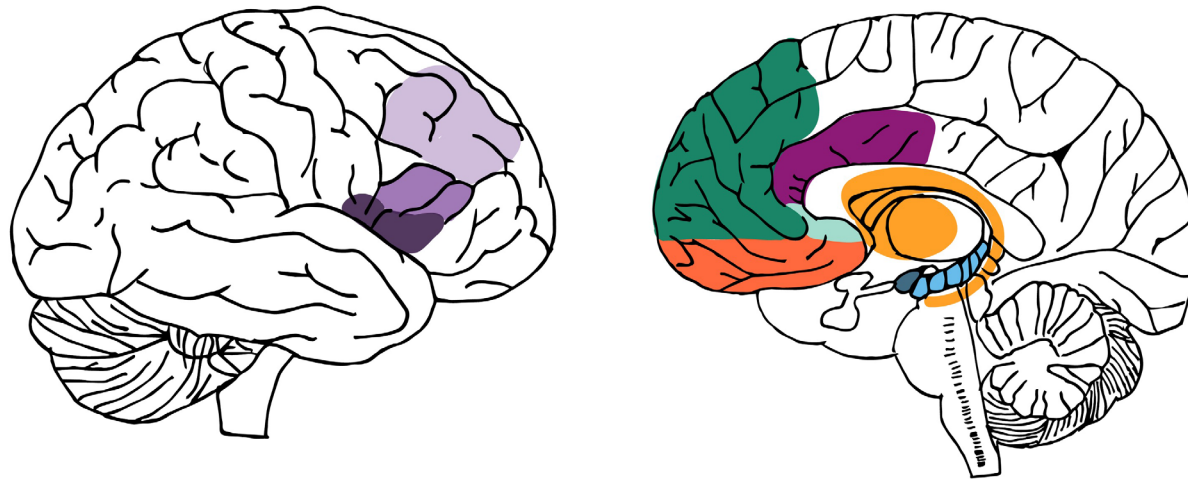


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Brain Development



Key Brain Circuits



Corticolimbic

Important for:
socioemotional processing

Executive Control

Important for:
self-regulation

Corticostriatal

Important for:
reward processing

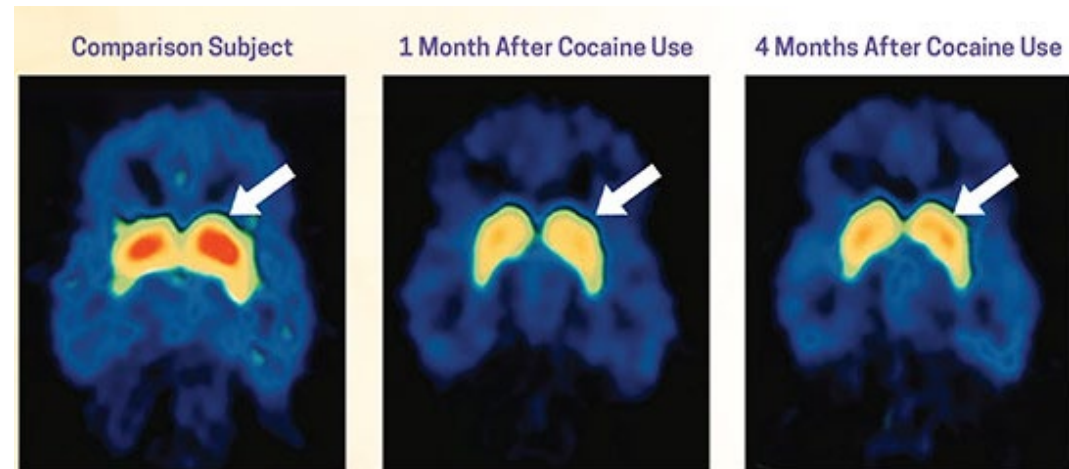
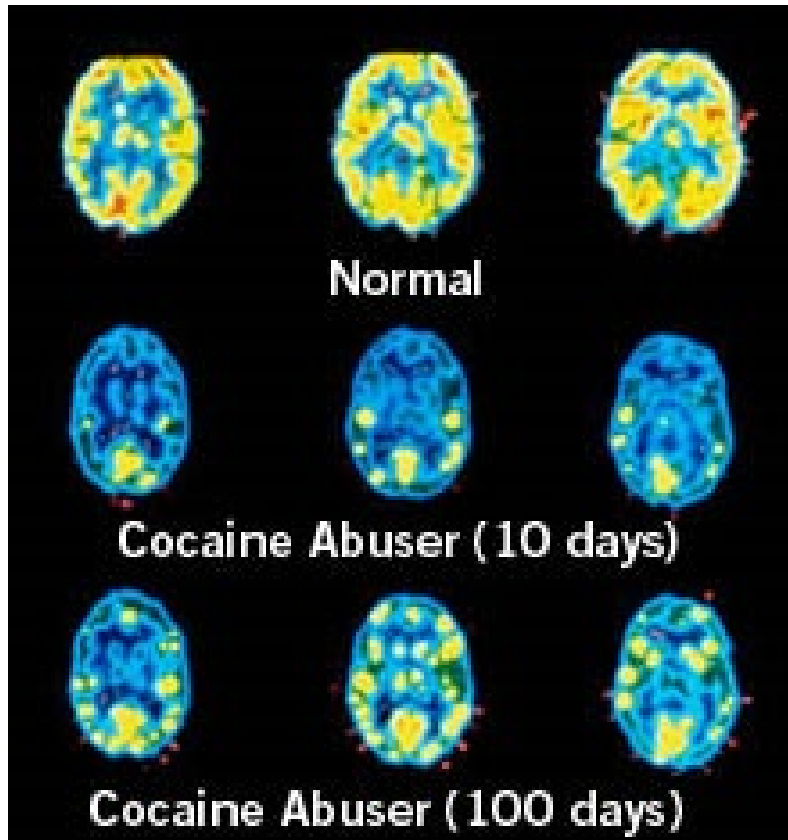
- Medial Prefrontal Cortex
- Ventral Anterior Cingulate Cortex
- Hippocampus
- Amygdala

- Dorsolateral Prefrontal Cortex
- Dorsal Anterior Cingulate Cortex
- Inferior Frontal Gyrus
- Anterior Insula

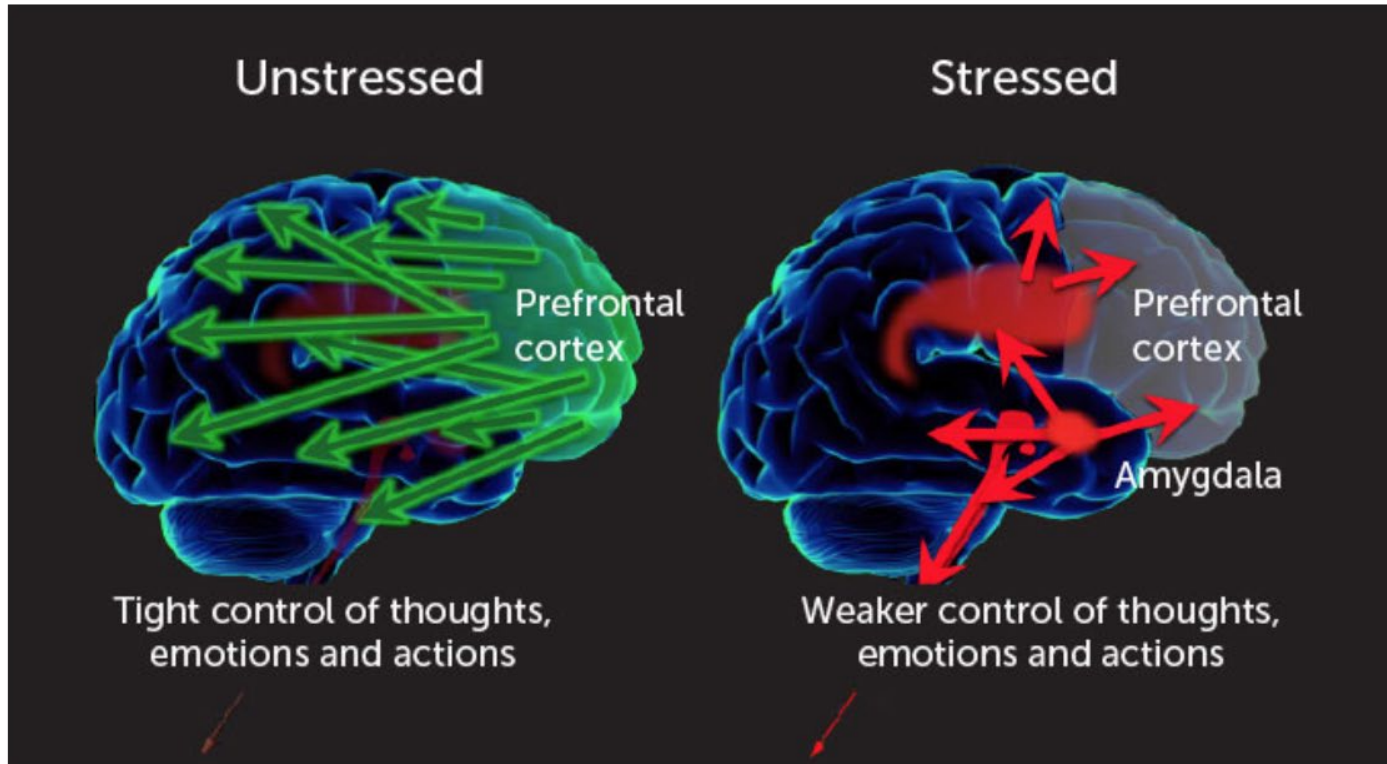
- Orbitofrontal Cortex
- Striatum



Drug Dependency Recovery (Cocaine)



STRESS IMPACTS BRAIN ARCHITECTURE



Normally, an alert person's brain has moderate amounts of chemical messengers that lead the prefrontal cortex to take charge and perform high-level thinking (left). But with stress, those chemical signals can flood the brain, activating amygdala-linked brain networks involved in sensing and responding to threats (right).

A. ARNSTEN



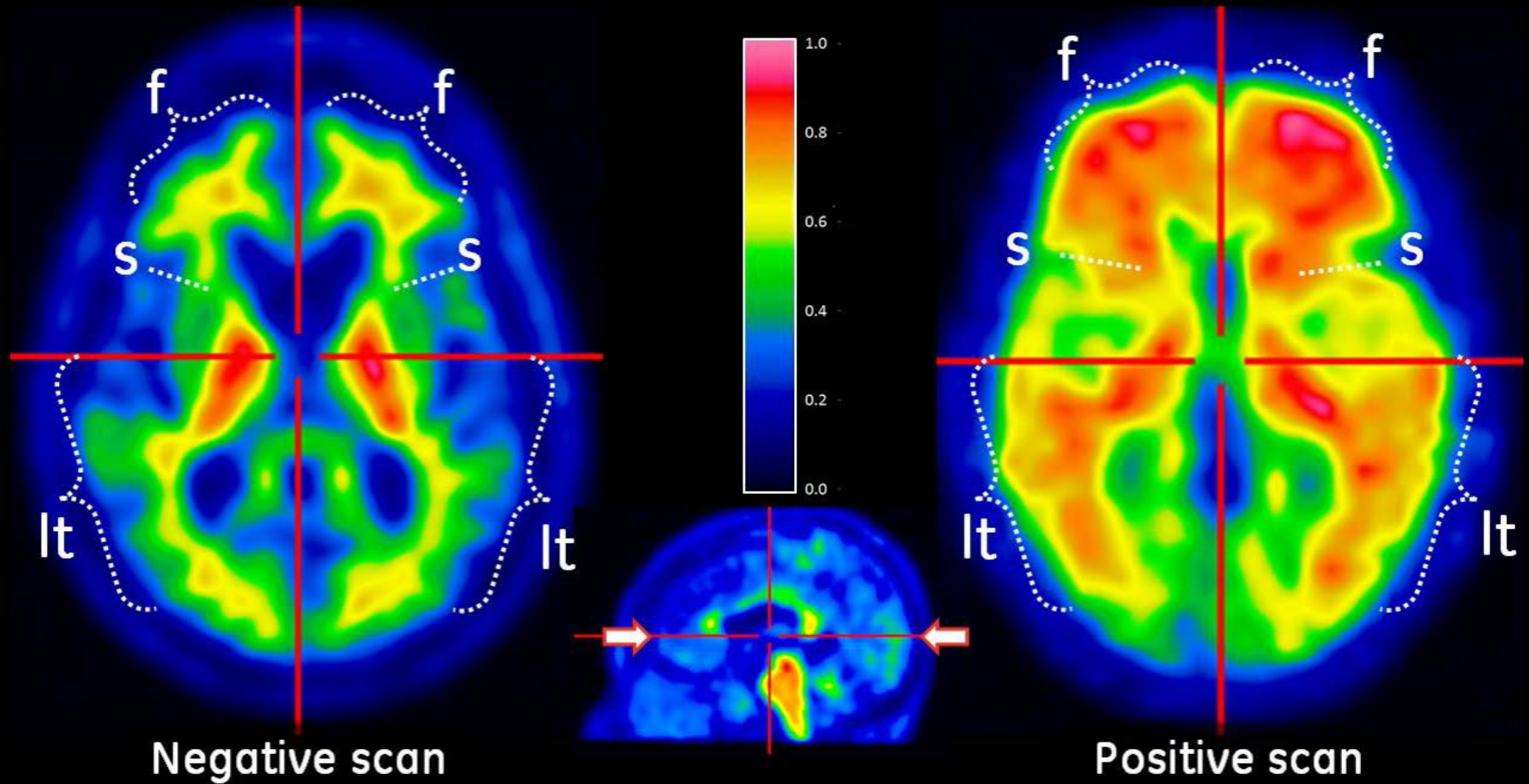
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Learnings from Neuroscience



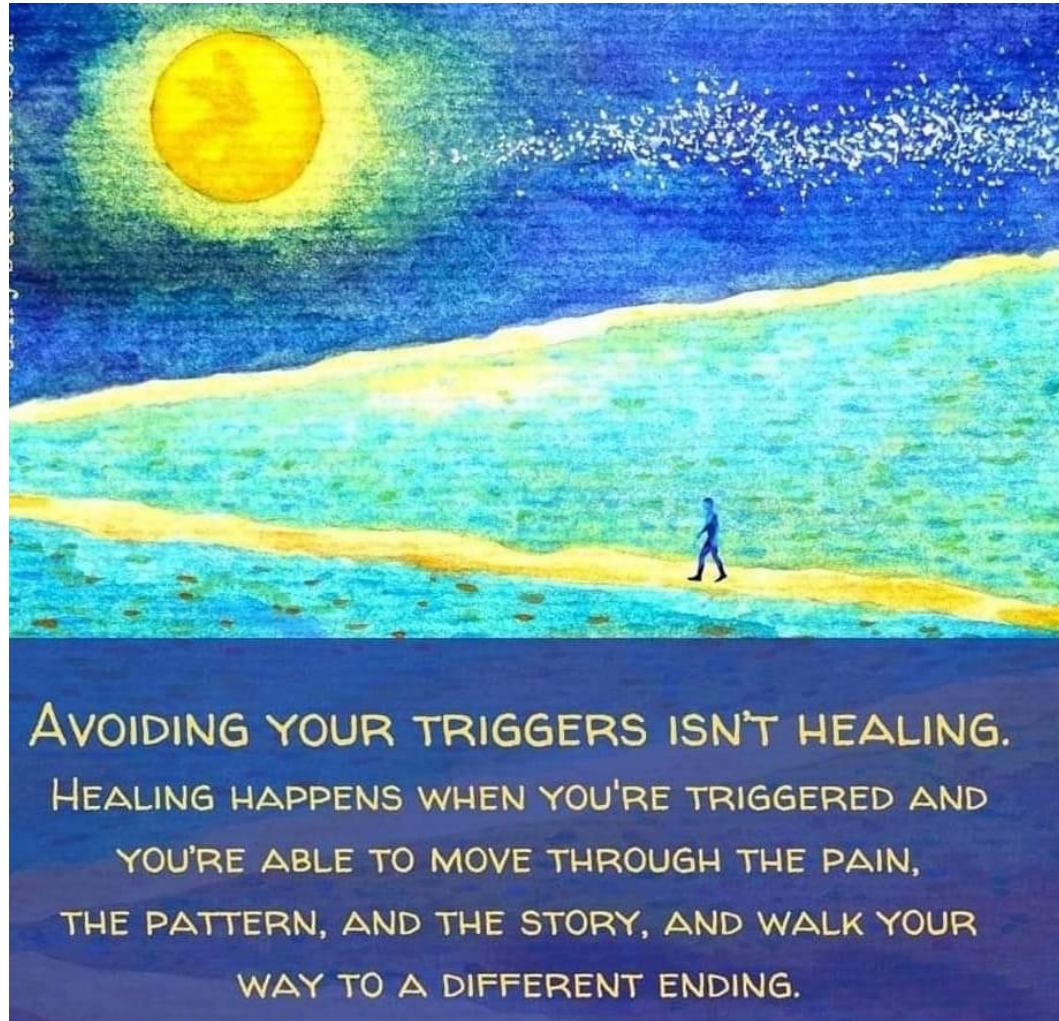
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BRAIN HEALTH



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Feel it to Heal it



AVOIDING YOUR TRIGGERS ISN'T HEALING.
HEALING HAPPENS WHEN YOU'RE TRIGGERED AND
YOU'RE ABLE TO MOVE THROUGH THE PAIN,
THE PATTERN, AND THE STORY, AND WALK YOUR
WAY TO A DIFFERENT ENDING.



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Interoception

a pre-requisite skill for self-management and self-regulation. It provides the tools to know when we are developing emotional reactions and the skills to be in control of these reactions.

Interoception is Everywhere!



In The Car

In the car, interoception might help me feel...

- If the seatbelt is too tight, too loose or just right
- If the seats are too hot to sit on
- If the sun shining through the window is too bright
- If the movement of the car is comfortable or downright uncomfortable (car sick!)
- If the sound of the radio is pleasing
- If the destination of the car ride is exciting or dreadful
- If the A/C or heat needs to be turned up

www.kelly-mahler.com



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Be curious

What happened to you?

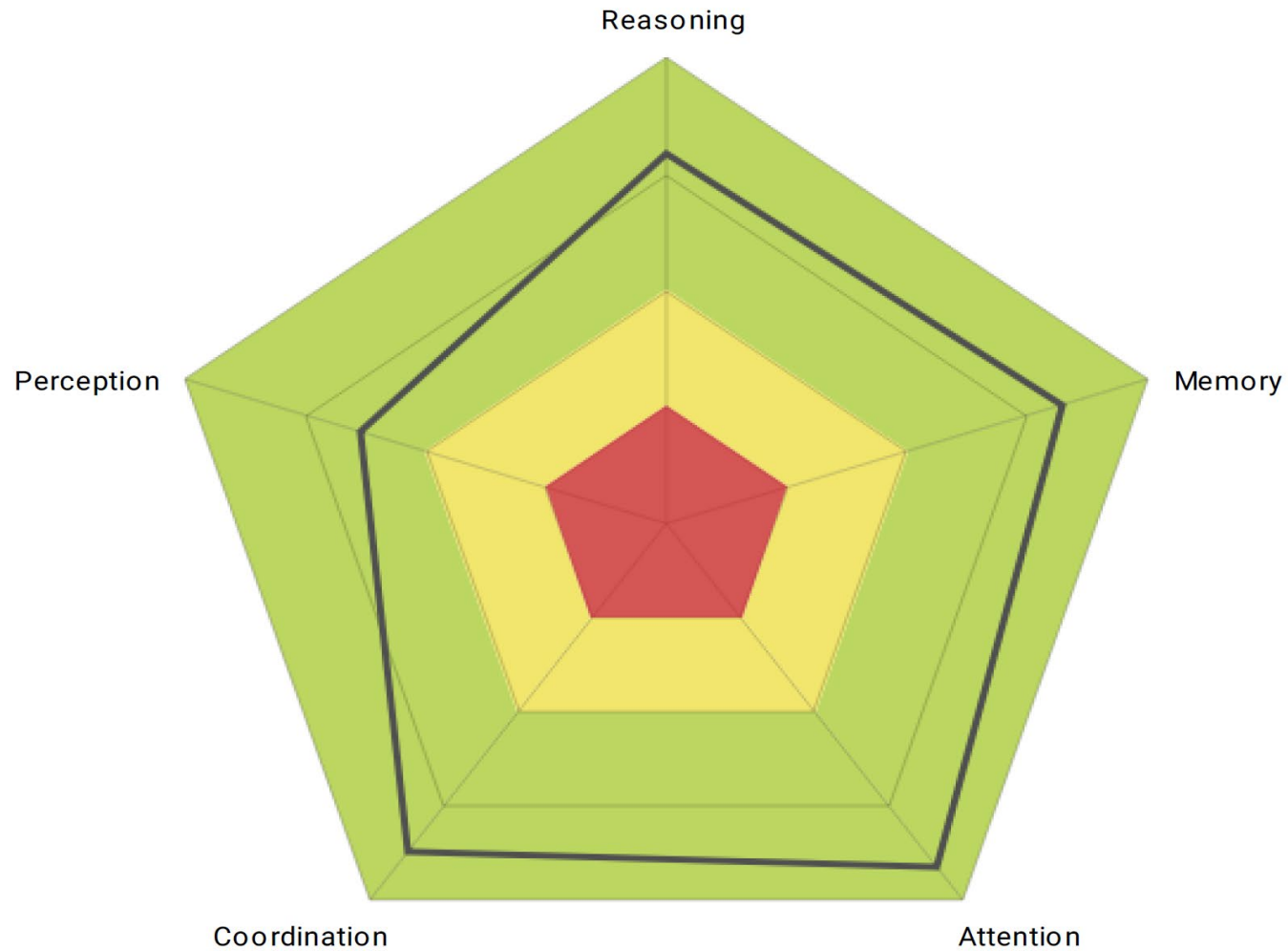


Know your community

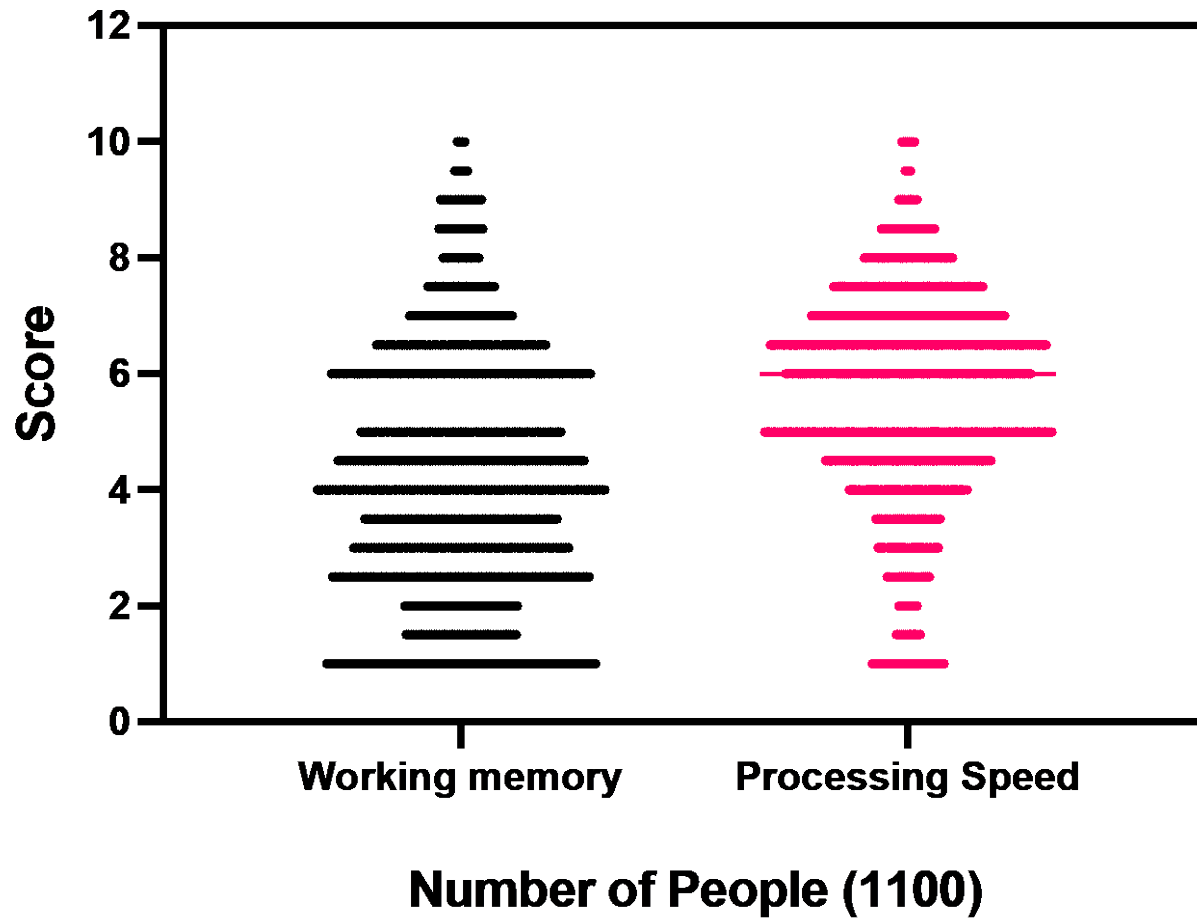


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Cognifit Brain Health Screener



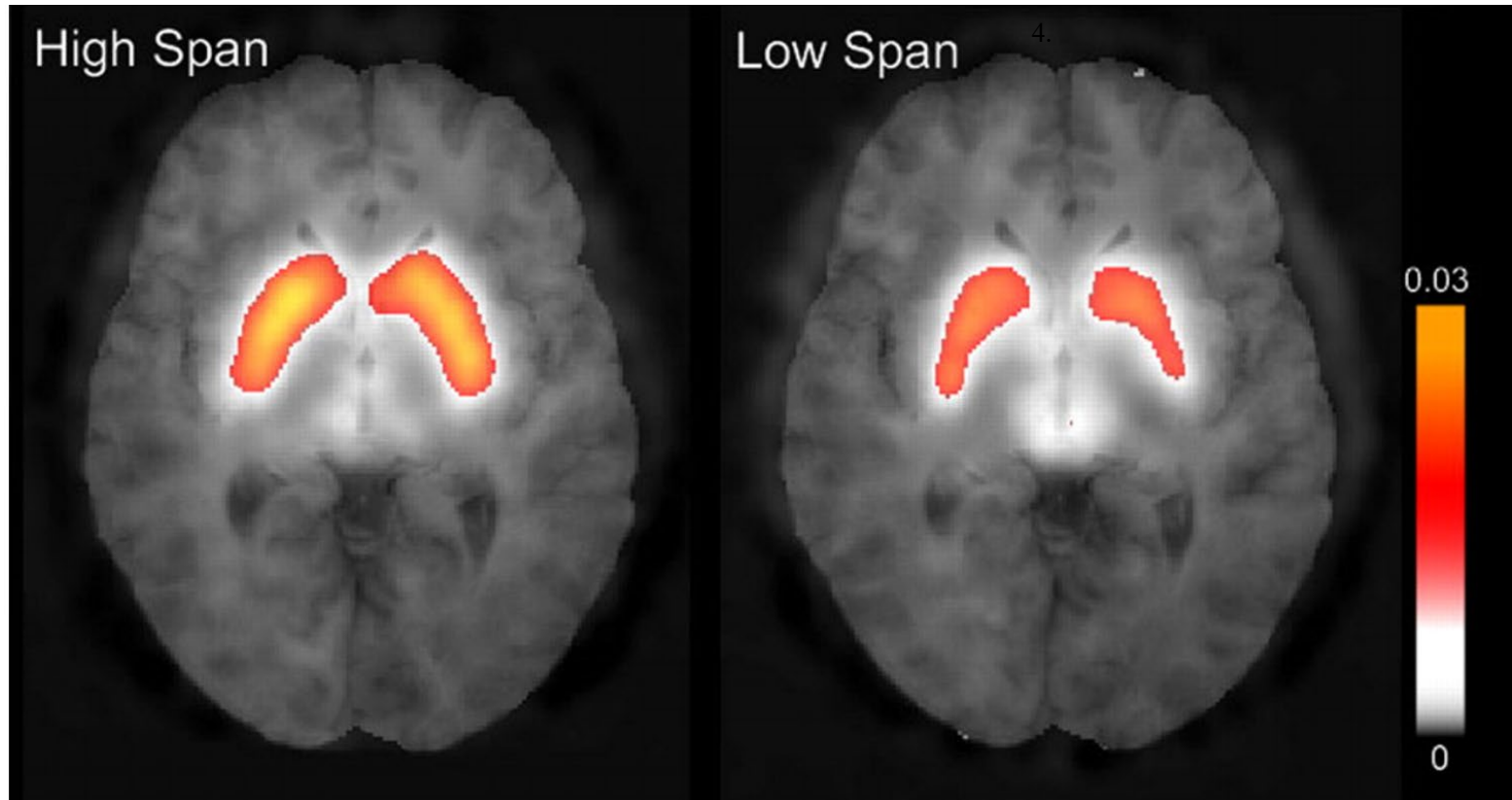
Brain Health Screening



Cognitive training is the delivery of intense but game-like mental exercises that target the development of specific cognitive skills.

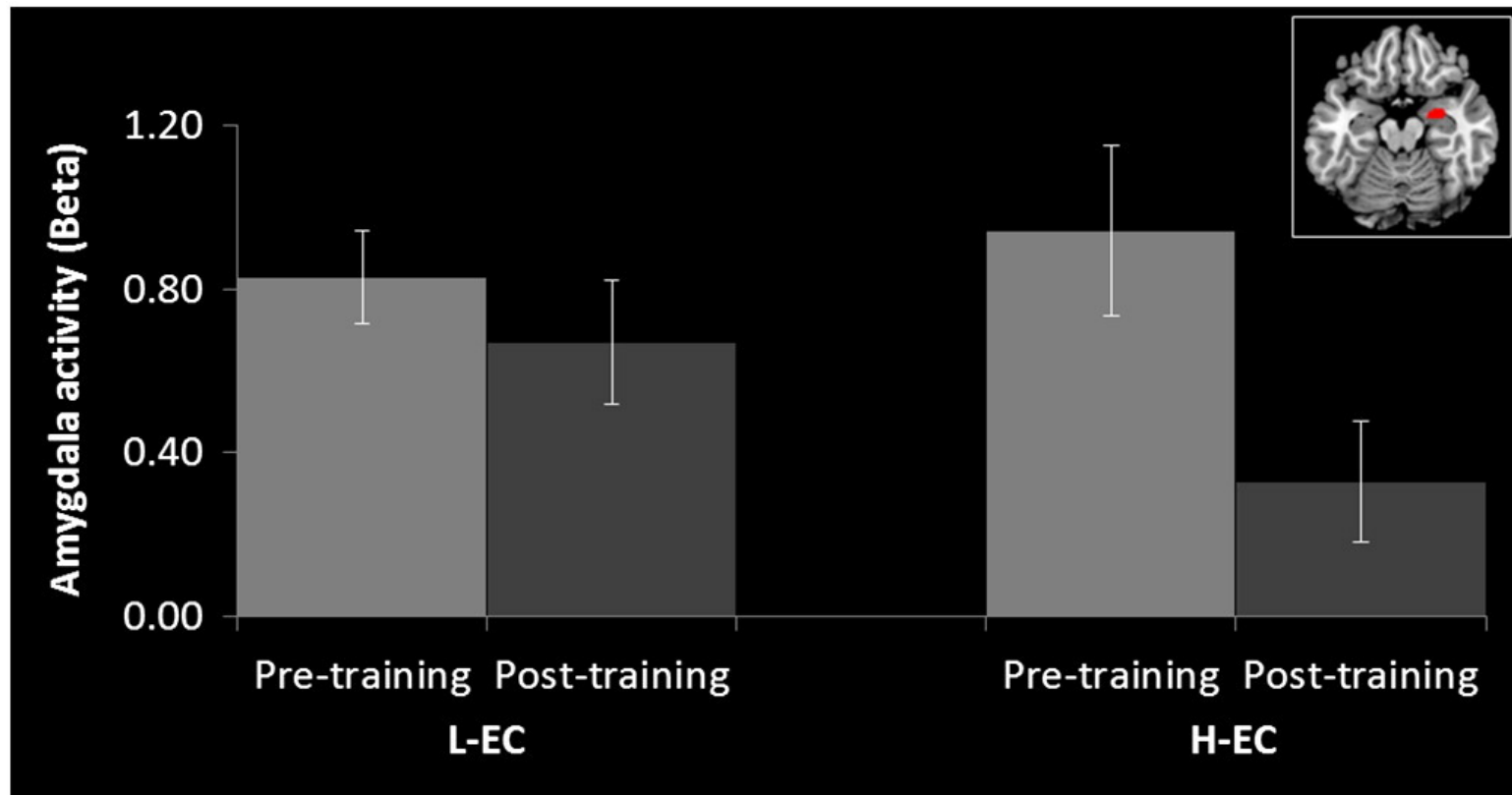


Working Memory can increase dopamine



Cognitive training improves mood



Non-emotional training can induce changes in amygdala reactivity to aversive information and alter amygdala–prefrontal connectivity.






Improving Working Memory Effects

Archival Report

Remember the Future: Working Memory Training Decreases Delay Discounting Among Stimulant Addicts

Warren K. Bickel^a  , Richard Yi^a, Reid D. Landes^b, Paul F. Hill^a, Carole Baxter^c

[Show more](#) 

10.  Add to Mendeley  Share  Cite

<https://doi.org/10.1016/j.biopsycho.2010.08.017> 

 Restricted access | Research article | First published online June 17, 2011

Getting a Grip on Drinking Behavior: Training Working Memory to Reduce Alcohol Abuse

[Katrijn Houben](#) , [Reinout W. Wiers](#), and [Anita Jansen](#) [View all authors and affiliations](#)

[Volume 22, Issue 7](#) | <https://doi.org/10.1177/0956797611412392>

Impaired Decision Making Related to Working Memory Deficits in Individuals With Substance Addictions.

Original Investigation | [Open Access](#) | [Published: 27 November 2017](#)

A high working memory load prior to memory retrieval reduces craving in non-treatment seeking problem drinkers

[Anne Marije Kaag](#) , [Anna E. Goudriaan](#), [Taco J. De Vries](#), [Tommy Pattij](#) & [Reinout W. Wiers](#)

[Psychopharmacology](#) **235**, 695–708 (2018) | [Cite this article](#)

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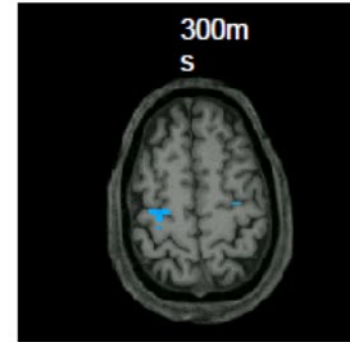
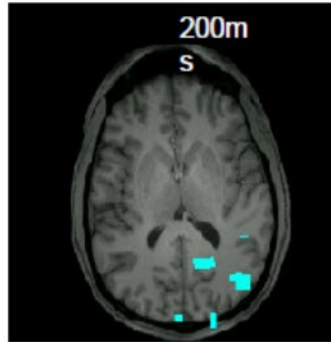
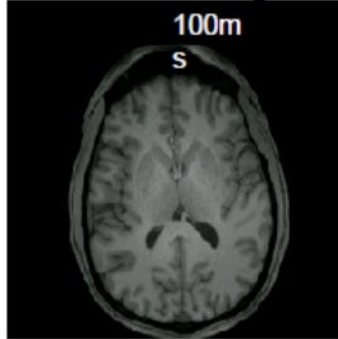


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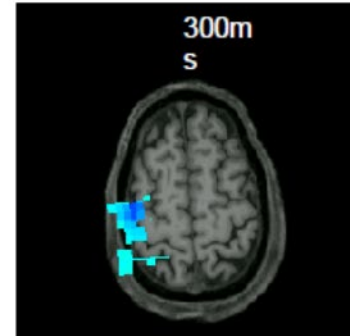
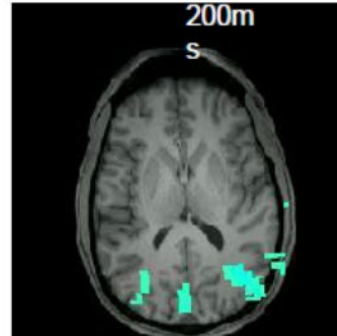
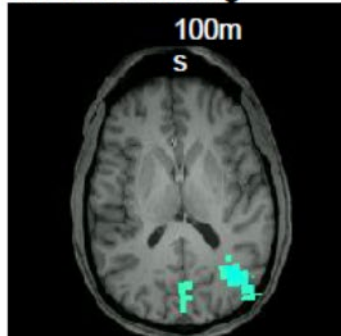
Brain Speed Matters

Faster is
Smarter

BEFORE Training



AFTER Training



A noisy
brain is a
slower
brain



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Strengthening the Thinking Brain

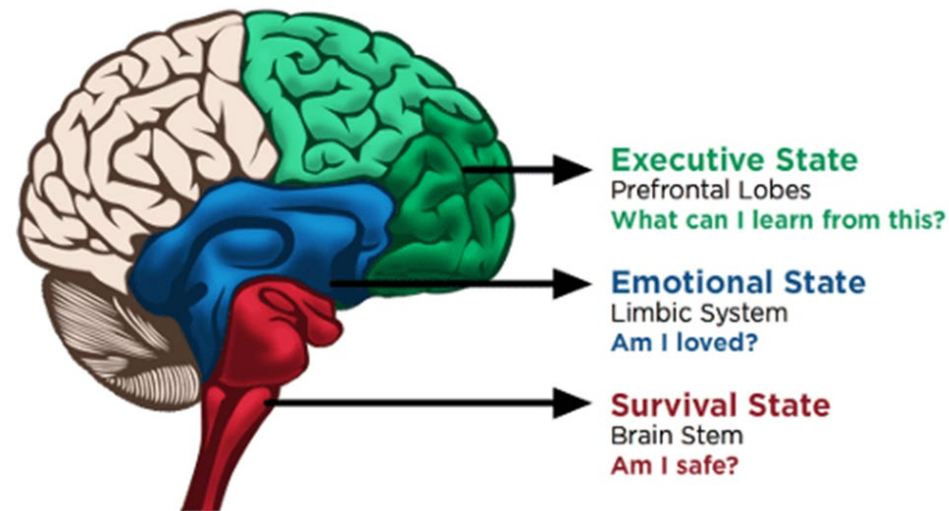
Subjects who did 14 hours of brain exercises had a 48% decreased rate of dementia 10 years later. This decade-long study found that only one kind of brain exercise lowered dementia risk. i.e. Processing Speed



How do we help people move from surviving to thriving?

Brain Health, Healing and Fitness

1. Understand your brain so that you can understand others.
2. Teach others about their brain and the power of neuroplasticity.
3. Co-regulate and teach how to change Brain Stem and Limbic reactivity through culture and connection.
4. Strengthen Pre-frontal Cortex (cognitive skills).



Yili Program

INDIGENOUS
10 -17 year olds

Sports: Basketball, NRL, Rugby Union, Boxing

Cultural Activities: Painting, dancing, yarning, Elders

Technology: Microsoft workshops, drones, apps

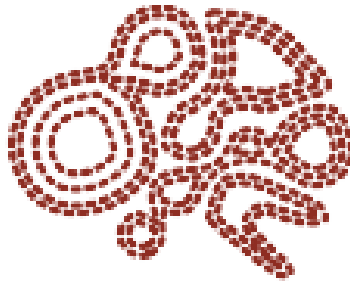
Education: Literacy and Numeracy, VTQ Curriculum

Neuroplasticity Programs: Lego, Computer Games

Pathways: School, Training, Employment



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