Applied Educational Neuroscience in Our Homes

- Dr. Lori Desautels
- Assistant Professor
- College of Education
- Butler University



Educator Nervous System

Behavior management is about adults. Our brains and bodies hold the state of our nervous systems, and it takes a steady adult to settle a child or adolescent.

Co-Regulation

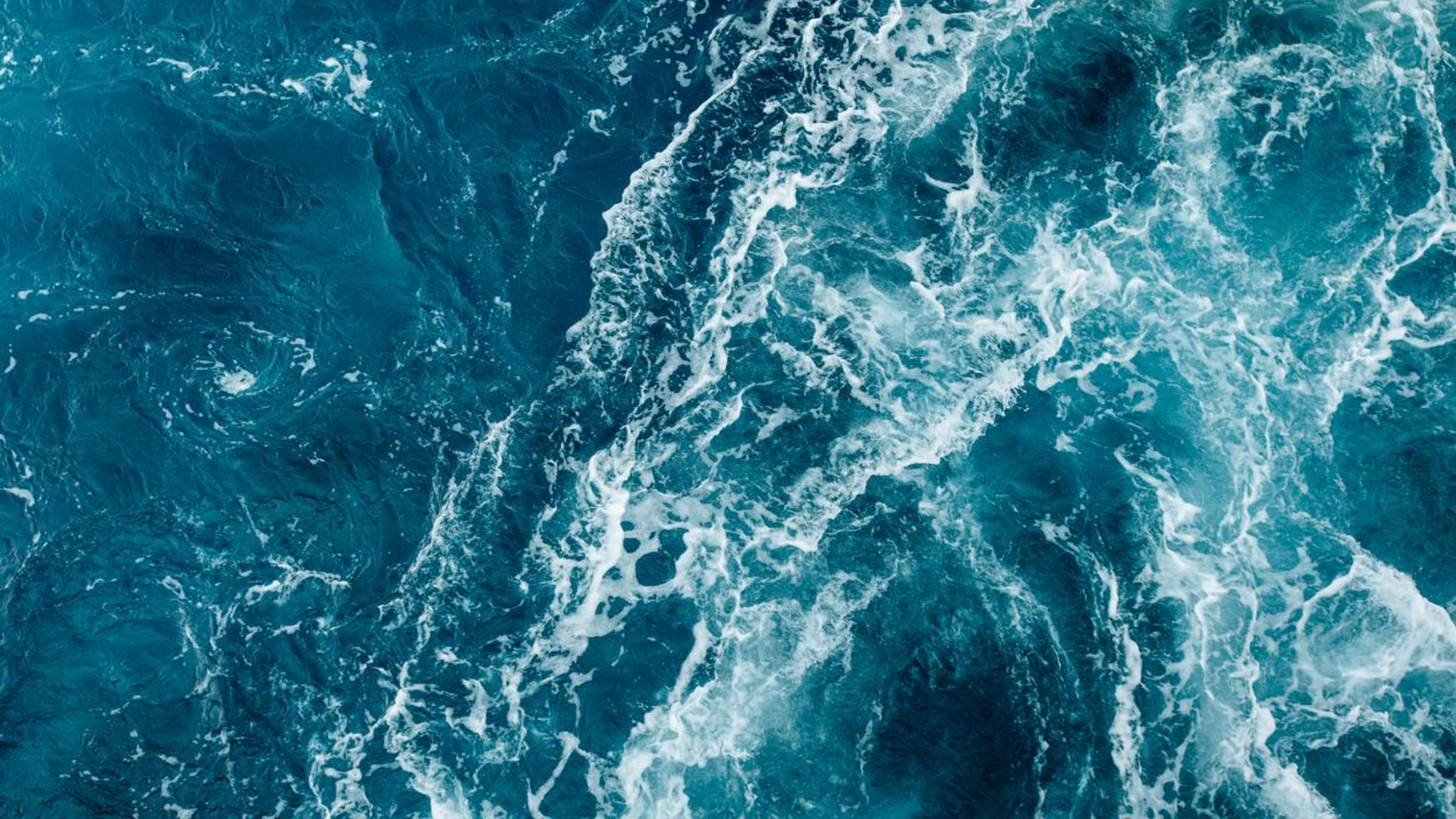
Co-regulation is our biological priority. Co-regulation is at the heart of discipline protocols. When we share a safe, emotionally available sanctuary of space and a trusting presence, students can borrow from our calm in moments of dysregulation. Co-regulation is often nonverbal.

Touch Points

Touch points are micro-moments of connection that often occur through our facial expressions, tone, greetings, noticings, validation, and deeply listening as we follow the student's agenda.

Language of the Nervous System

When we understand that negative behaviors are only signals addressing the dysregulation of the nervous system, we begin to feel empowered and relieved. The way we feel, think, and behave is a nervous system response. As we teach our staff and students about their neuroanatomy, we learn together.



Behaviors

- A student's behavior isn't about me. They're not doing this to me. It's a symptom like a sneeze showing us a cold, a cut with a wound, or a scab showing us healing. This behavior is signaling that the nervous system is rough. Can we become curious? What is underneath this behavior?





Behavior is only a signal and symptom!


Big Feelings Are More Than OK!

Behavior is only a signal that our nervous systems are struggling!





We broadcast
our physiological states
through our touch,
faces, gestures, postures
and through the
intonation of
our voices.

Warming Up the Nervous System for Learning!

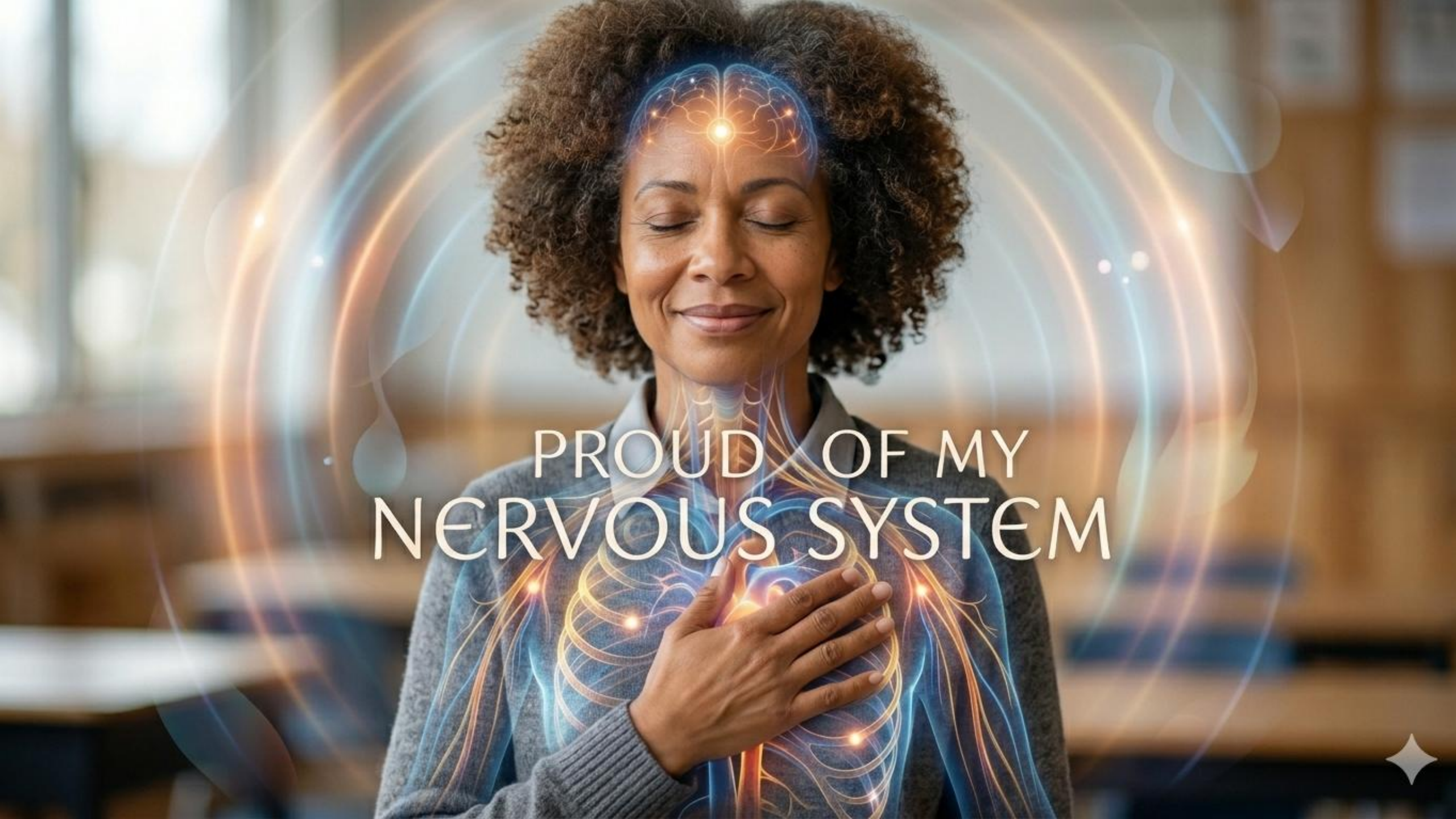
- Getting to the Cortex
- Just because I face another wonderful day of parenting, I need to warm up my nervous system to find some ease and steadiness. Just because I am physically present does not mean I am emotionally and mentally present.
- If we do not warm up, our performance is impacted negatively. (Injuries, lack of focus, attention and critical mental skills)



Warming Up the Nervous System for Learning

- Getting to the Cortex
- Just because a student walks in and they are physically here, does not mean they are emotionally and mentally present.
- If we do not warm up, our performance is impacted negatively. (Injuries, lack of focus, attention and critical mental skills




PROUD OF MY
NERVOUS SYSTEM

Your adult body still carries the story of your childhood nervous system.



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My Nervous System is the Intervention

- Settled adults have settled students.
- Our Nervous Systems Are Contagious
- We need to do our own work.



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Miserly Brain –Rooted in Our Evolution as a Species

- The brain is like a homebody, as it is set in its ways constantly blocking new stimuli and filtering out most of our experiences.
- It often resists new experiences that might force it to alter its complex circuitry.



Neuroscience says...

Your brain will choose familiar hell over unknown peace. That's why self-sabotage feels safe and healing feels terrifying.

The **amygdala** flags the unfamiliar as **danger**.

Even if “new” = healthy habits, a calm relationship, or rest...

If your brain hasn’t seen it before, it triggers a **stress response.**

Your brain's #1 job is to keep you **alive.**

Not happy. Not fulfilled.

Just safe - as defined by past experience.

"If we ourselves are not ok, children will sniff it out and by contagion catch the adults dis-ease . The student's nervous system will then default to its survival seeking behaviors of fight flight or shut down!!"

– Claire Wilson

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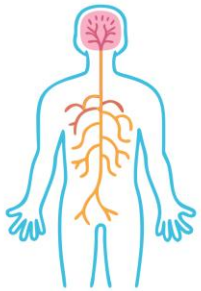
Micro Rituals and Moments Add Up

1 minute

RELEASE AND RESET

Practice: Roll shoulders, gently shake out hands, and finish with an audible sigh.

The Purpose: Supports the completion of stress cycles by releasing stored activation from the nervous system and body.



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2–3 minutes

COOL SCENTED BREATHING

(Interoceptive Awareness & Regulation)

Practice: Each adult receives two scented, cool wipes and places them anywhere from the neck up—across the face, forehead, or back of the neck.

As adults notice the cool sensation and gentle scent, they are invited to become aware of their breath. For about one minute, they take slow, deep breaths at their own pace. Soft music may be added to support a sense of safety and calm.

The Purpose: This practice strengthens interoceptive awareness, the ability to notice internal body sensations, while supporting nervous system regulation through breath, scent, and temperature.



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Touch Invites Presence

- Our skin is so tightly tied to emotion. When someone touches you, they are reaching right into your emotional brain. We come equipped with a neurobiological touch radar. (The Neuroception of touch.)
- We read touch more accurately than we do facial expressions, as connection is an essential ingredient for our nervous systems. - Amanda Blake



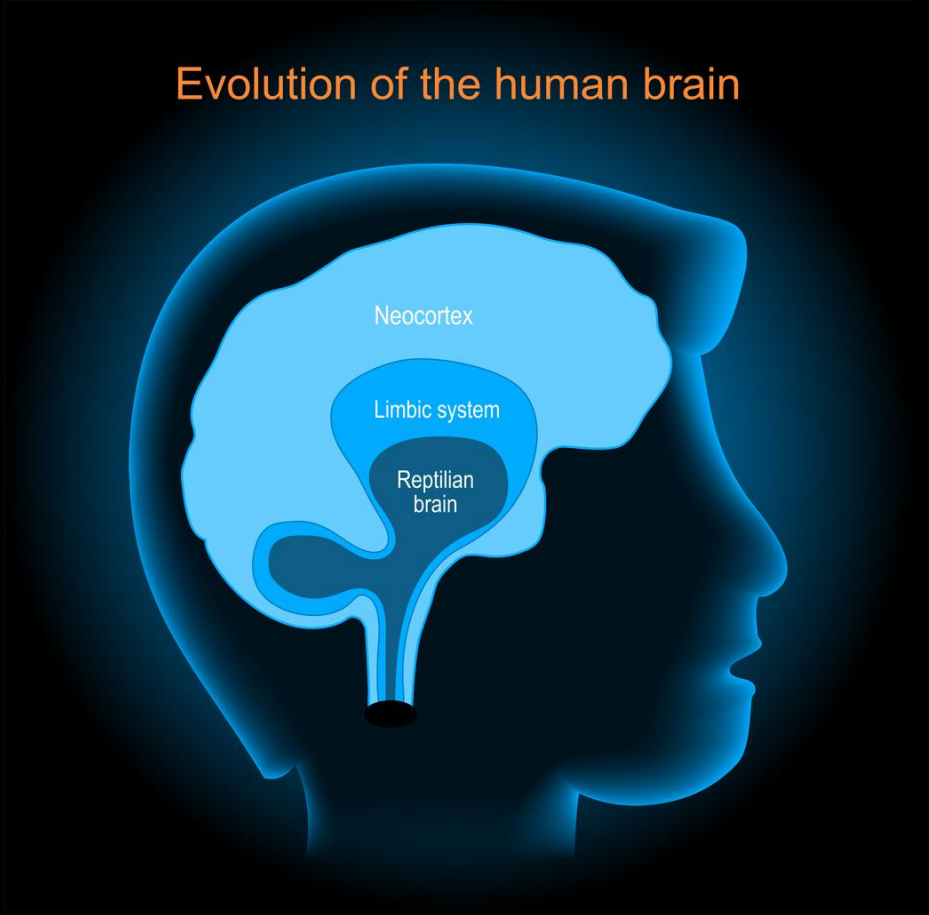
Co-Regulation

- Children and youth are able to use a steady adult nervous system as extensions of themselves. An emotionally attuned educator or caregiver also shapes the growth of the child's or youth's emotional systems. It is all about integration



Developing Brain

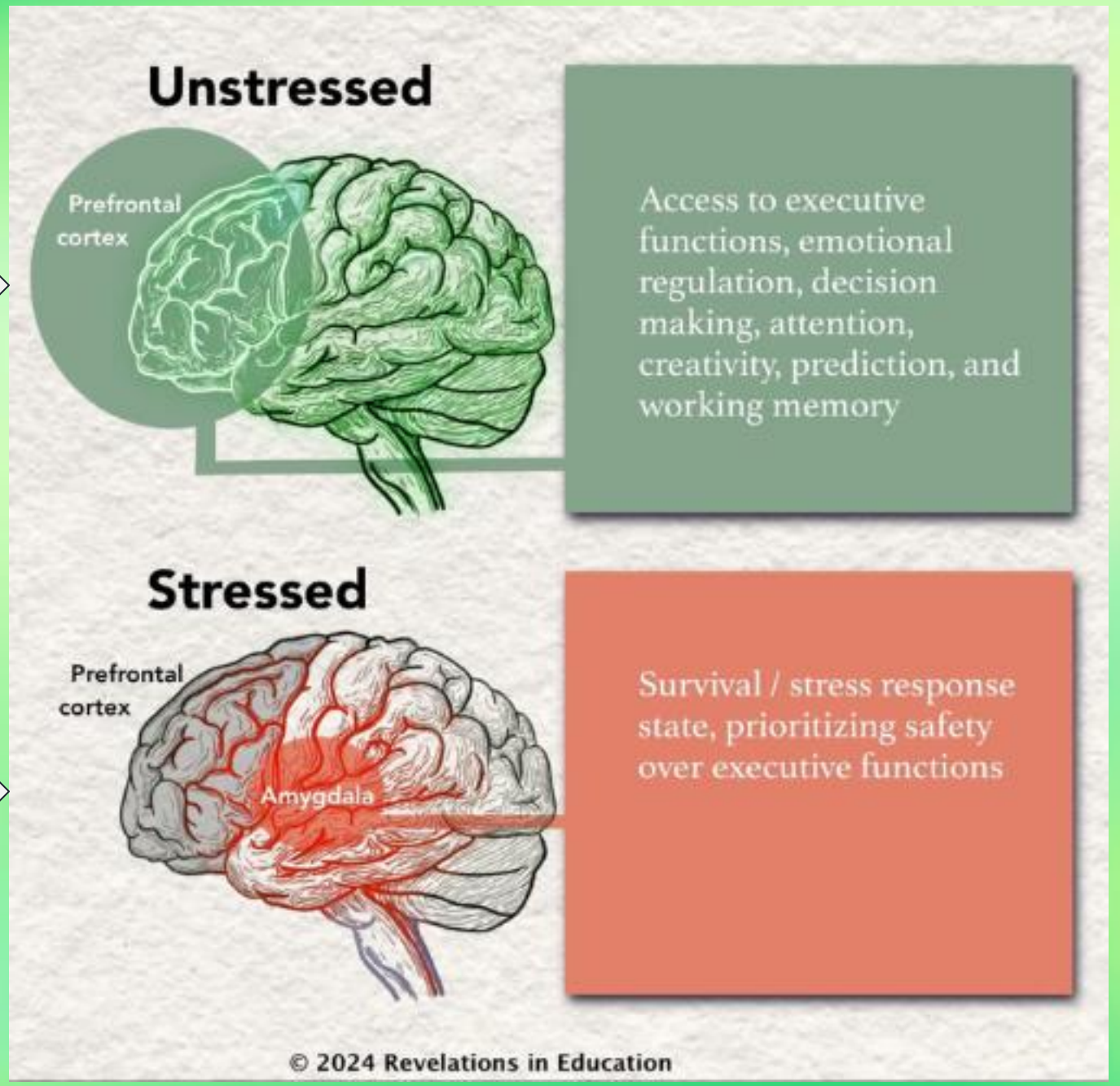
- Brainstem- Ancient, Regulatory functions (sweat , shiver, heart rate, digestion, etc.) releasing hormones, survival and safety – Regulation
- Limbic System- Love, Fear, Emotional part of the brain, Anxiety- develops early and quickly –Relational
- Cortex- Newest part, we share this region with primates and apes, and it holds our executive functions. – Reasoning



Tight control of thoughts, emotions, and actions

The nervous system prioritizes survival, then emotion, then cognition. In that order!

Weak control of thoughts, emotions, and actions



Feeling Safe and Feeling Connected



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The Biology of the Room

- Emotions aren’t just "feelings"—they are biological instructions, and in a classroom, they are contagious.

Stress is Contagious

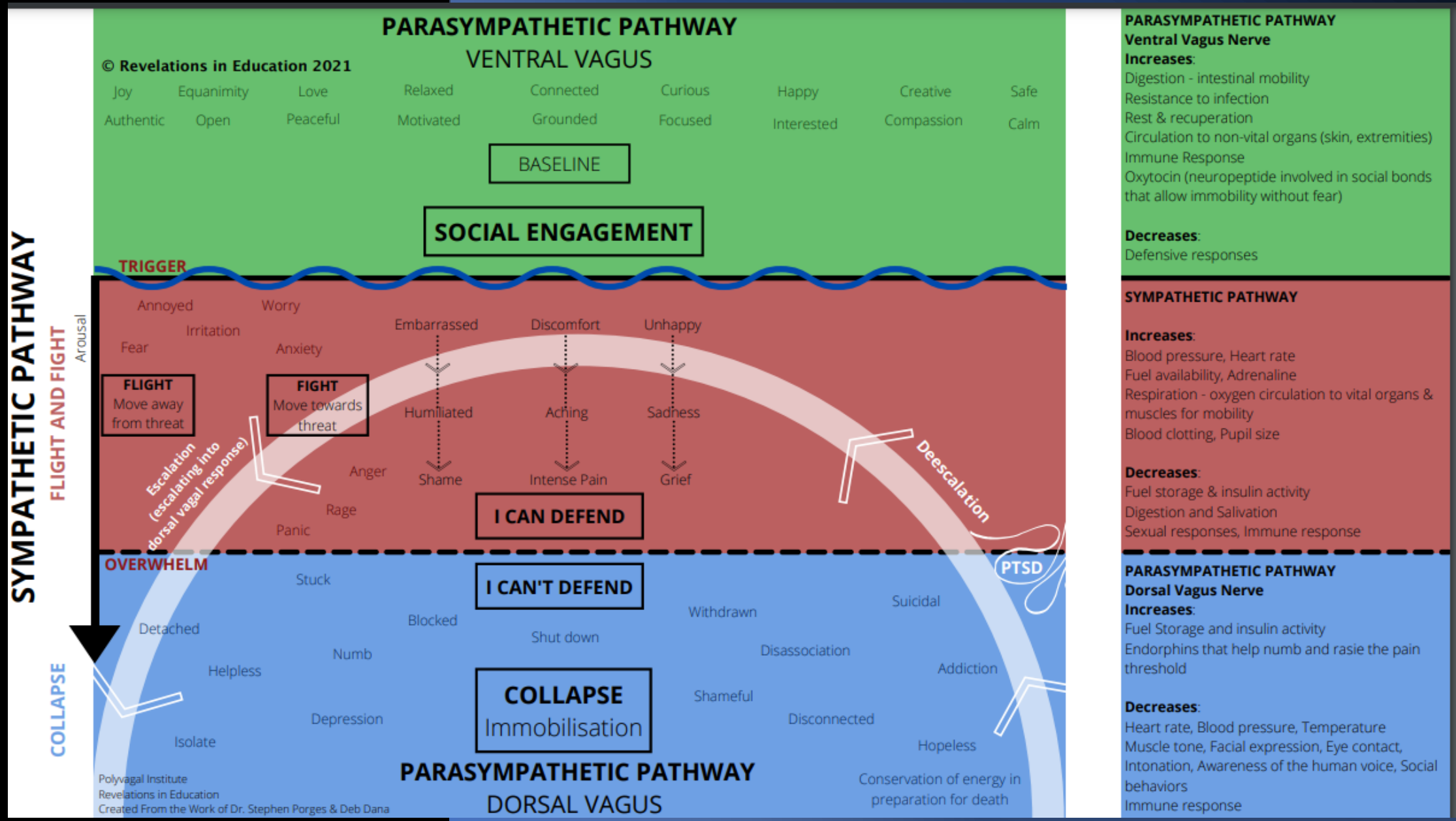
- **Stress is 'contagious' and 'shows on our skin'**

- Dr Tara Swart says stress is contagious as it can leak from one person's sweat and affect others. She explains that this contagious stress could cause others to experience heightened levels of stress, impacting their overall mental and physical health.

- She warns it is important to be aware of our own stress levels and acknowledge the potential influence it can have on those in our vicinity. When asked by Steven Bartlett if stress is contagious, she replied: "Yes.“



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PARASYMPATHETIC PATHWAY
Ventral Vagus Nerve
Increases:
Digestion - intestinal mobility
Resistance to infection
Rest & recuperation
Circulation to non-vital organs (skin, extremities)
Immune Response
Oxytocin (neuropeptide involved in social bonds that allow immobility without fear)

Decreases:
Defensive responses

SYMPATHETIC PATHWAY

Increases:
Blood pressure, Heart rate
Fuel availability, Adrenaline
Respiration - oxygen circulation to vital organs & muscles for mobility
Blood clotting, Pupil size

Decreases:
Fuel storage & insulin activity
Digestion and Salivation
Sexual responses, Immune response

PARASYMPATHETIC PATHWAY
Dorsal Vagus Nerve
Increases:
Fuel Storage and insulin activity
Endorphins that help numb and rasie the pain threshold

Decreases:
Heart rate, Blood pressure, Temperature
Muscle tone, Facial expression, Eye contact, Intonation, Awareness of the human voice, Social behaviors
Immune response

The Student Polyvagal Chart

SOCIAL ENGAGEMENT

easy
curious
drip
playful
loose
flexible
fire
focus
connected
creative
dazzled
empathetic
strong
grounded
steady
safe



FIGHT FLIGHT

annoyed
nervous
anxious
irritated
extra
angry
gruff
panicked
frustrated
fearful
twisted
worried
furious



SHUT DOWN

tiny
rubbery
stringy
folded
loose
shame
trapped
disconnected
stuck
tired
sad
depressed
helpless
wounded



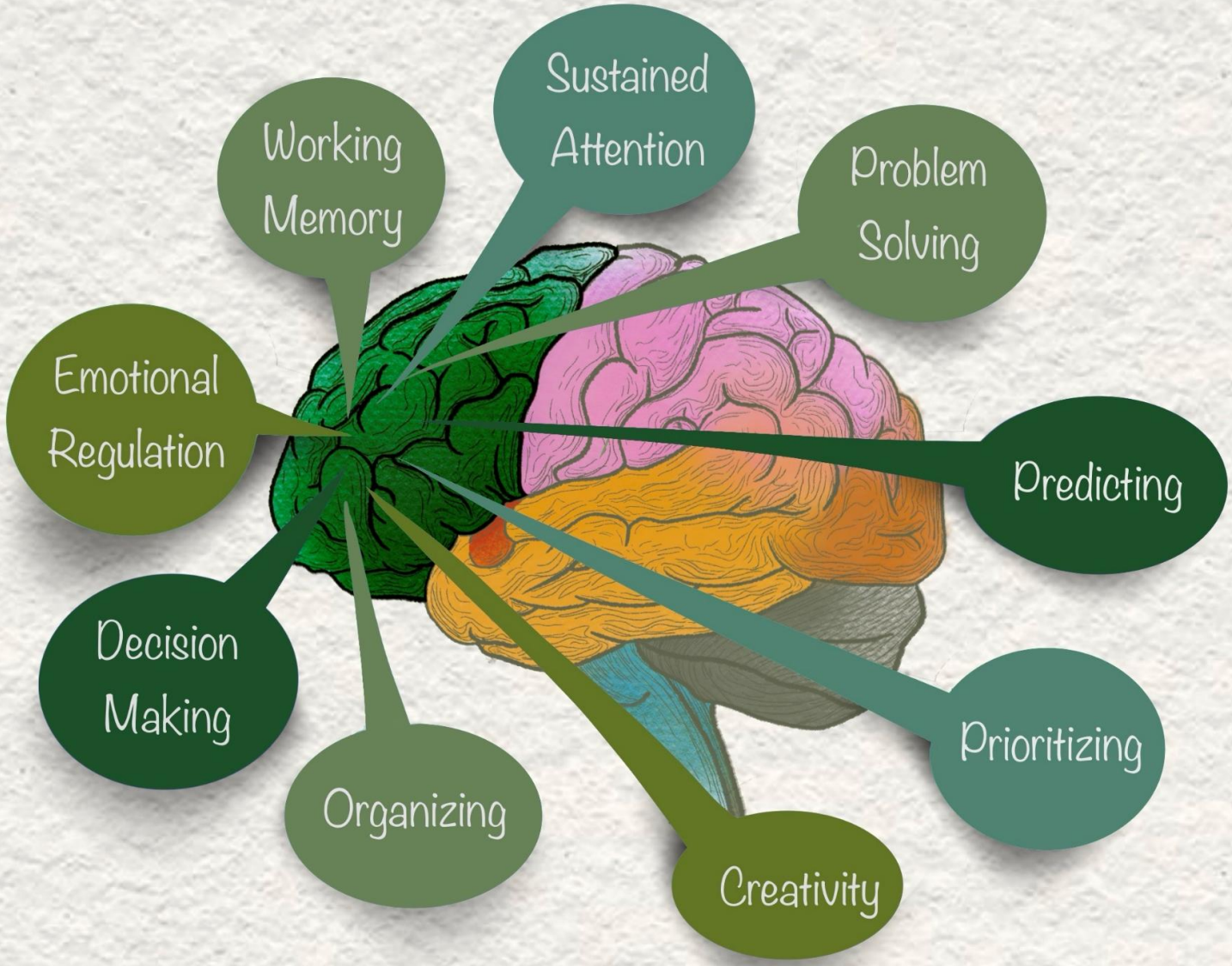
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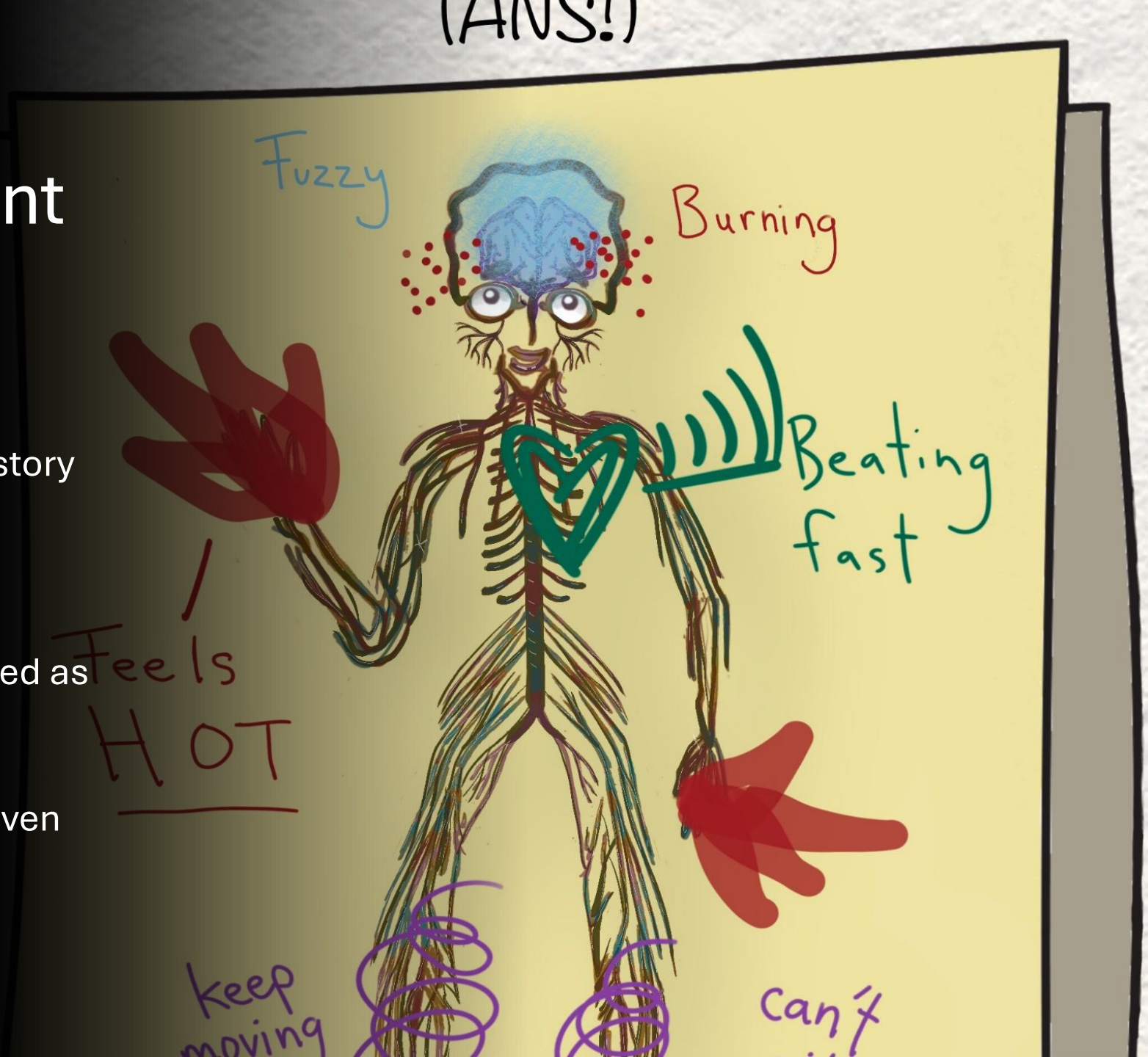
Prefrontal Cortex



All learning, discipline, and attention is about getting to the Cortex!

6th grade student

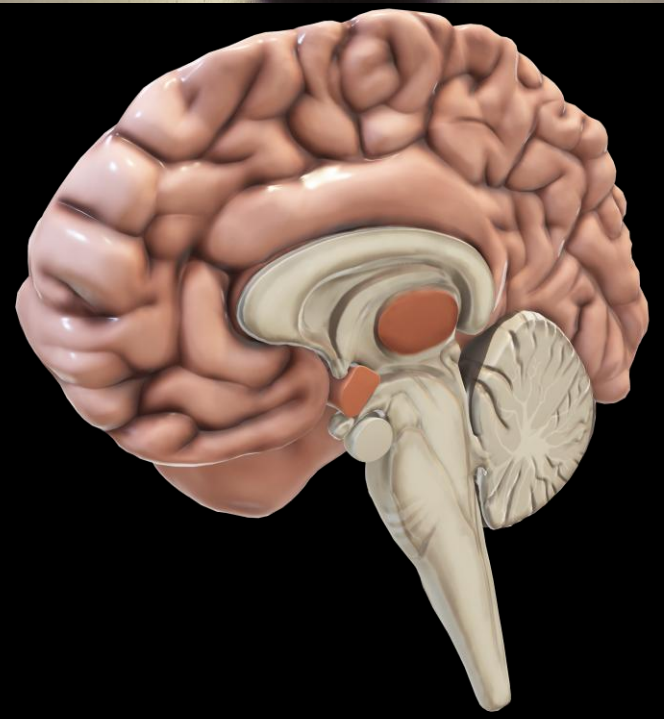
- Trauma has a signature
- Trauma is not primarily a story or memory; it is a state dependent imprint.
- Encoded in the ANS
- Interoceptive signals tagged as a mortal threat in the brainstem.
- Defensive states persist even when safety is cognitively known, but not felt!



What is Trauma? (It is what happens inside of us.)

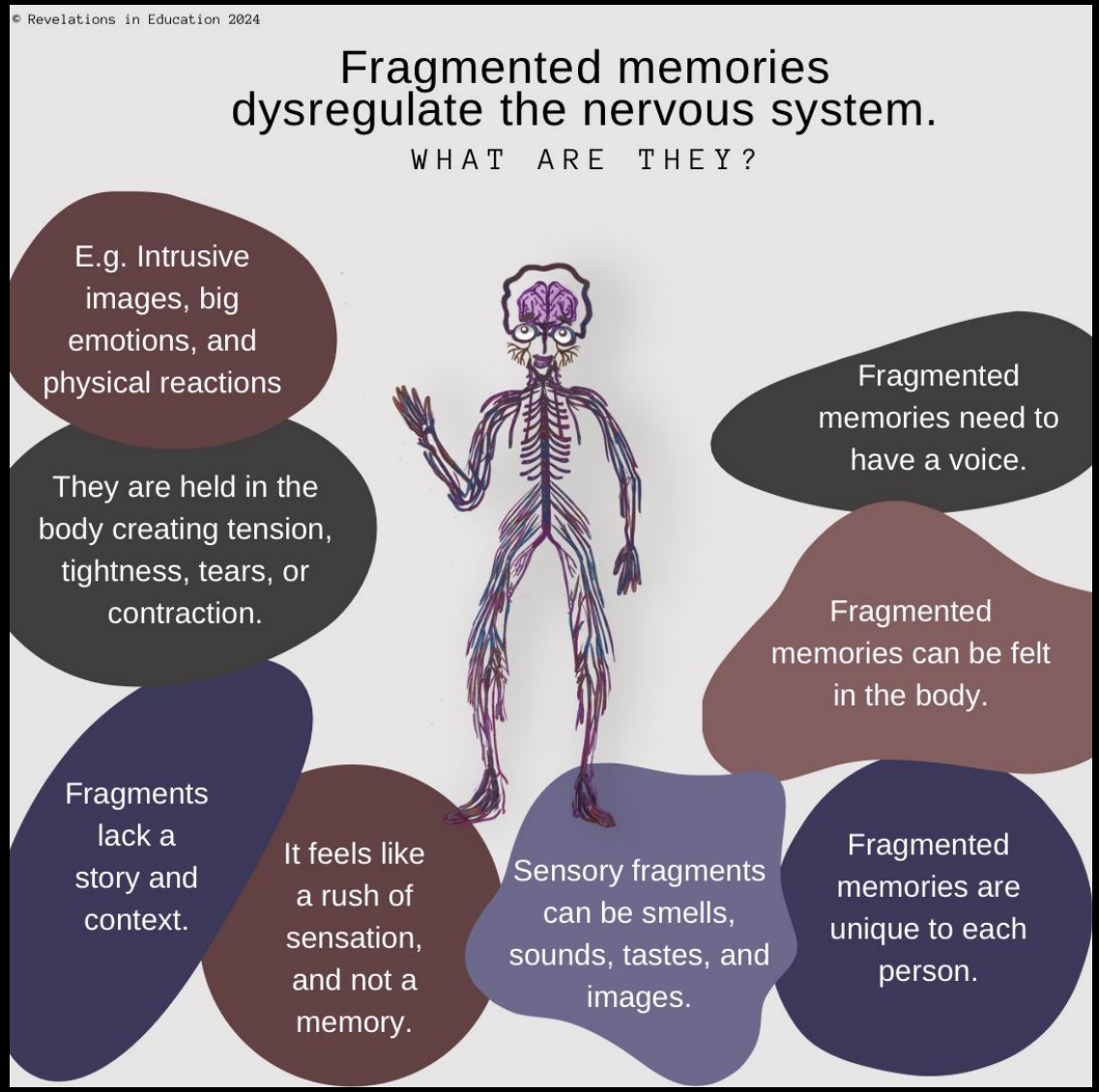


- Sensory Information is coming in too much, too fast, too soon, or too late, too little and too long!
- Our physiology is in a state of threat.
- Trauma breaks apart coherent experiences!
- There is a disconnection, a fracture of experiences
- Our experiences are fragmented.
- Trauma is all about our biological stress response systems.



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Fragmented Implicit Memories!



Trauma Logic

- It is logical to not trust adults at school if every adult in your developing years has mistreated or neglected your biological needs.
- It is logical to run from a space where you hear a loud noise or smells that are similar to the time of the traumatic event.
- It is logical to yell, fight and defend yourself if your perceived survival is at stake.
- It is logical to appease adults and say what you think they want to hear in hopes you will be left alone.
- It is logical to numb yourself if your perceived anxiety is overwhelming!



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Awareness matters most!
The state that we are in impacts who we are in the world and how we perceive the world.

Name the feeling out loud, and within seconds, amygdala activation lessens!



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Sensations



Collapsed
Freeing
Wavy
Trapped
Satisfied
Blah
Shivery
Mushy
Tender
Soggy
Rapid
Fuzzy
Light
Torn
Icy
Empty
Blinding
Melty
Heavy
Gooey
Full
Rough
Throbbing
Still
Open
Buzzing
Queasy
Burning

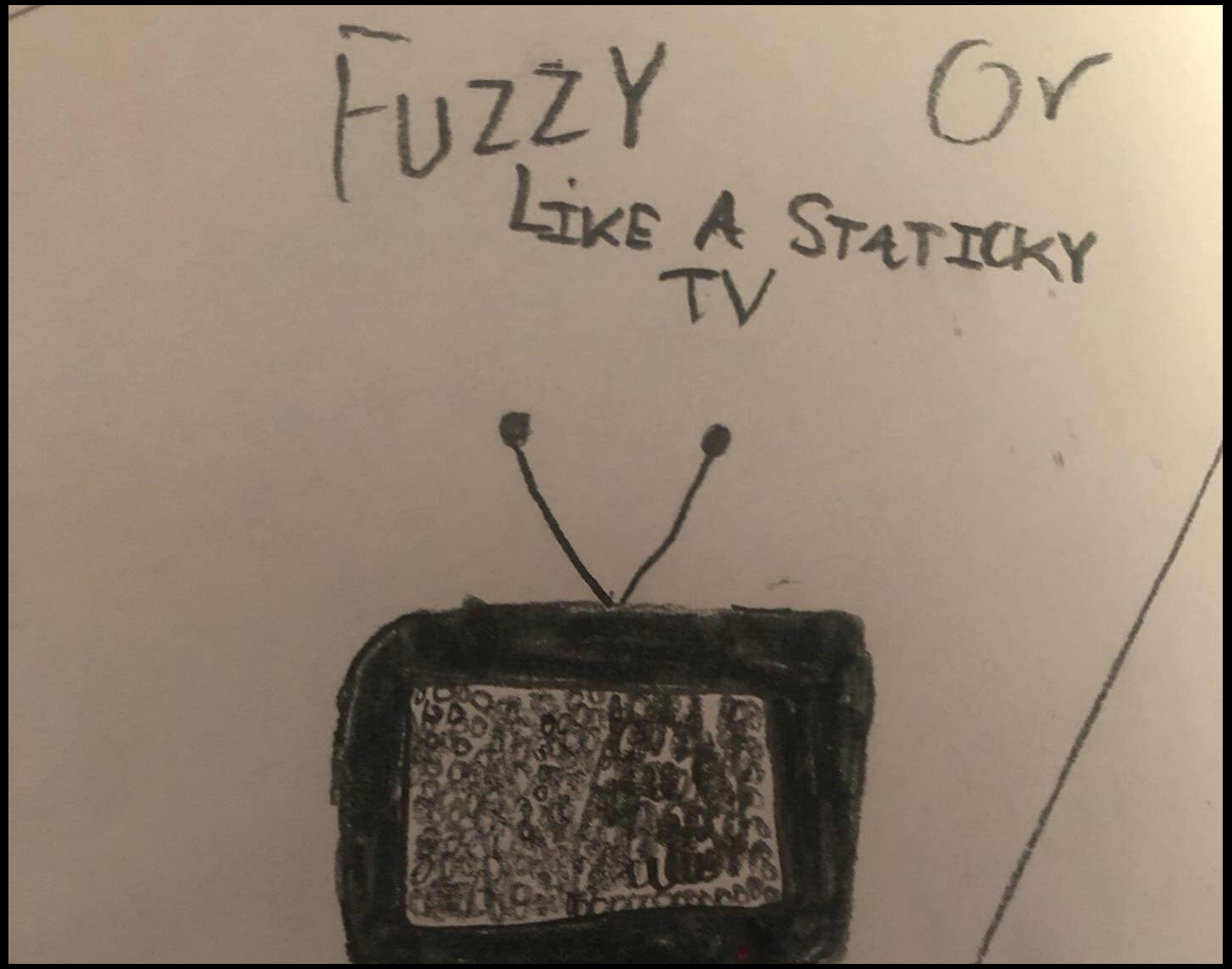
Smooth
Fluffy
Knotted
Achy
Electric
Tense
Frazzled
Cool
Cold
Thick
Fast
Teary
Peaceful
Dizzy
Numb
Coarse
Tight
Dull
Hungry
Hot
Hollow
Glittery
Bright
Frigid
Stuffy
Stiff
Itchy
Twitching
Lava
Airy
Bloated
Broken
Pounding
Undone
Bare
Bubbly
Boiling
Flat
Wonky
Warm
Roiled
Steady
Sore
Hesitant
Fluttery
Screeching
Slow
Prickly
Clammy
Wobbly
Sharp
Flash
Discombobulated
Scattered

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Sensations

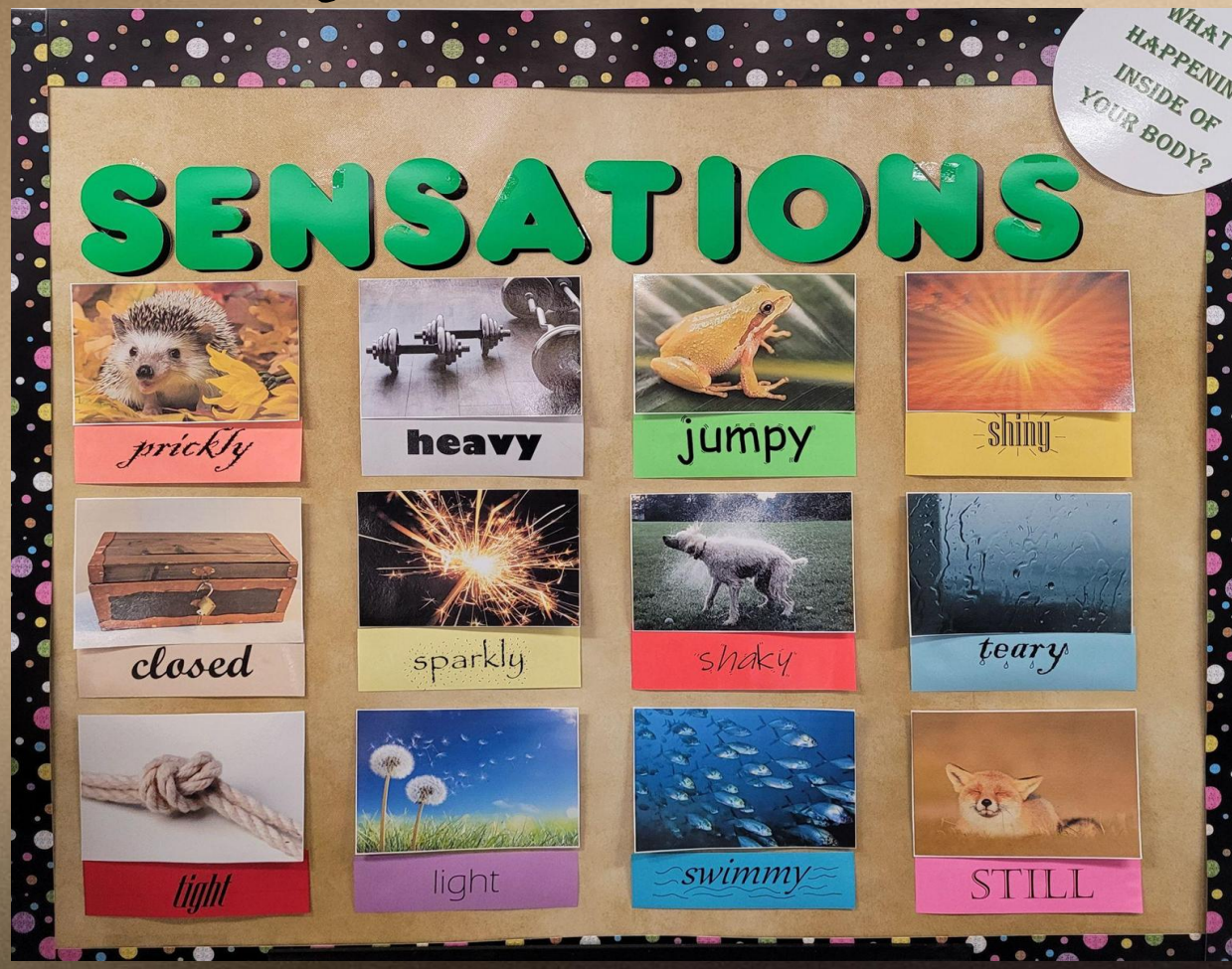


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Interoception



Teaching children the difference between emotions and sensations helps them regulate their nervous system. What they can name, they can tame. We call this our “sixth sense.”

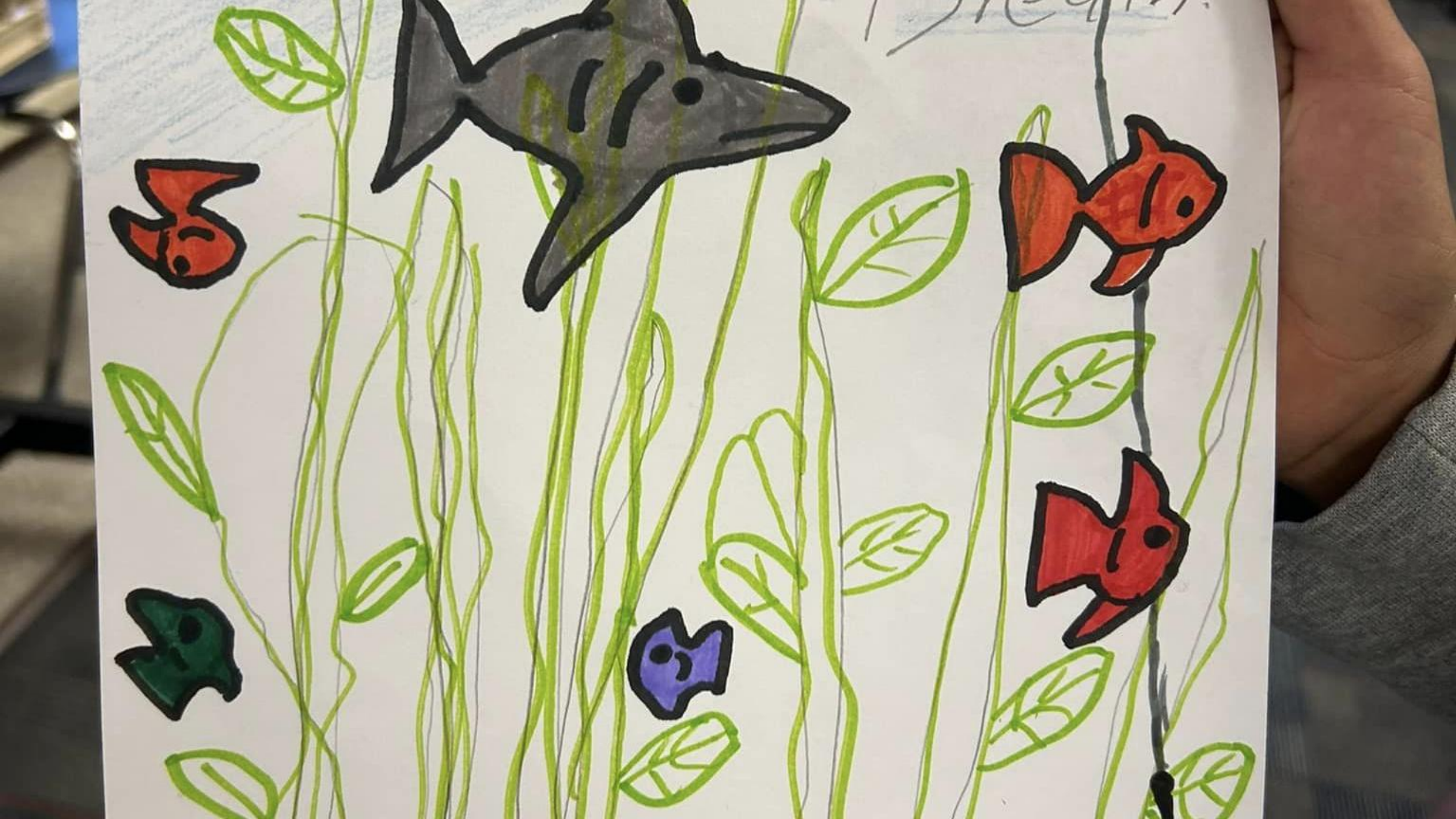


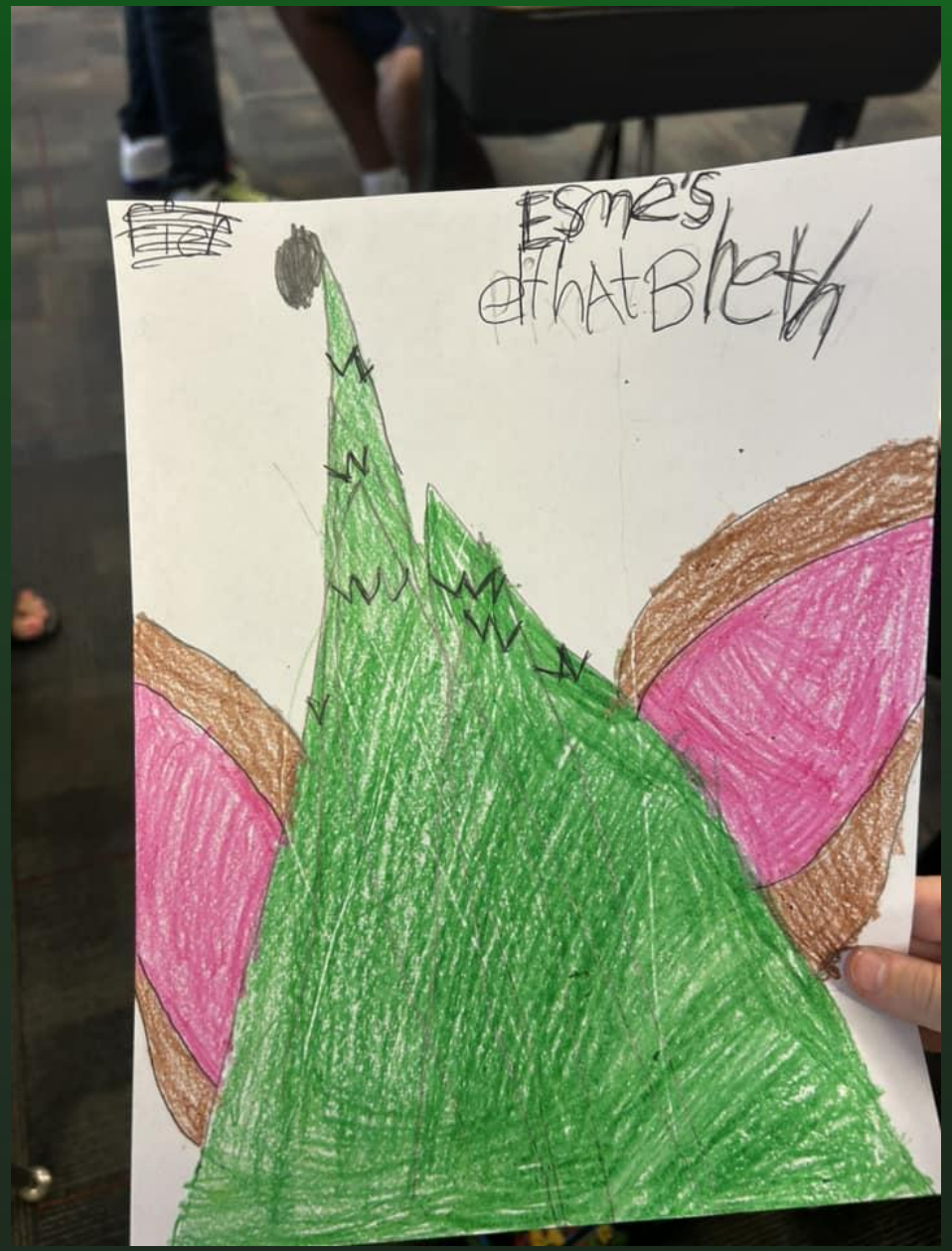


FoAP (The 4 Ingredients)

- We explain the why!
- These are always a choice.
- We ask our students and staff for feedback.
- We gradually build on the length of time!


Main
VIRVANA




Esme's
Christmas Tree


Derrick

MY INNER EAR MUSCLE STAPEDIUS MUSCLE! THIS IS AS TRUE FOR US AS IT IS FOR OUR CHILDREN AND YOUTH

- "Children who come from dangerous and toxic environments, often have delayed language and this can be the result of how our hearing changes when our nervous systems are in a threat and protect response. In a survival response, we do not hear the endings of words because the ear muscles are expanding and protecting us and so our ability to hear clear conversation, redirection, consequences, and the endings of words etc. is limited as we respond to the beginning of words and tones of voice!"
- Dr. Stephen Porges



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Anchors (Raise Our Window of Tolerance)

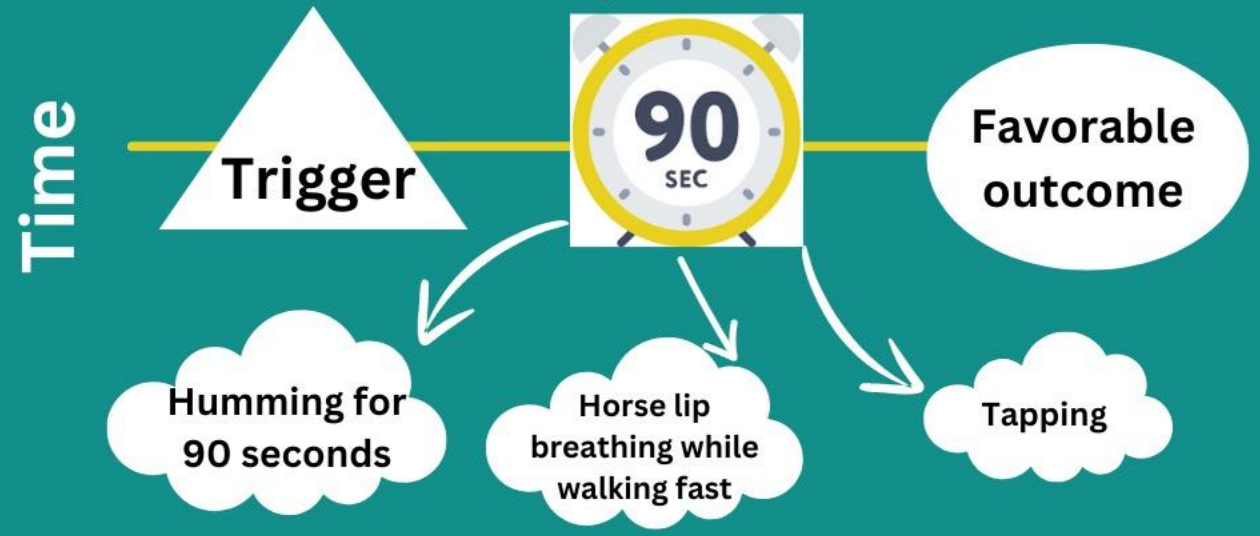
- What people anchor you?
  - Protective Figures-If there is danger, they help us feel protected. Examples might be caregivers, stuffed animals, teachers, parents, siblings, friends, therapists, or nature.
  - Wisdom Figures- Inner being, spiritual figures, authors, nature, poets, what else?
  - Nurturing Figures- ourselves, children, family, friends, spiritual, nature, animals, therapists, ancestors, heroes, what else?
- What places anchor you?
- What times, days of the week, or months and seasons anchor you?
- What things/ practices, experiences, conditions or objects or even a texture that anchors you?



90 Second Pause

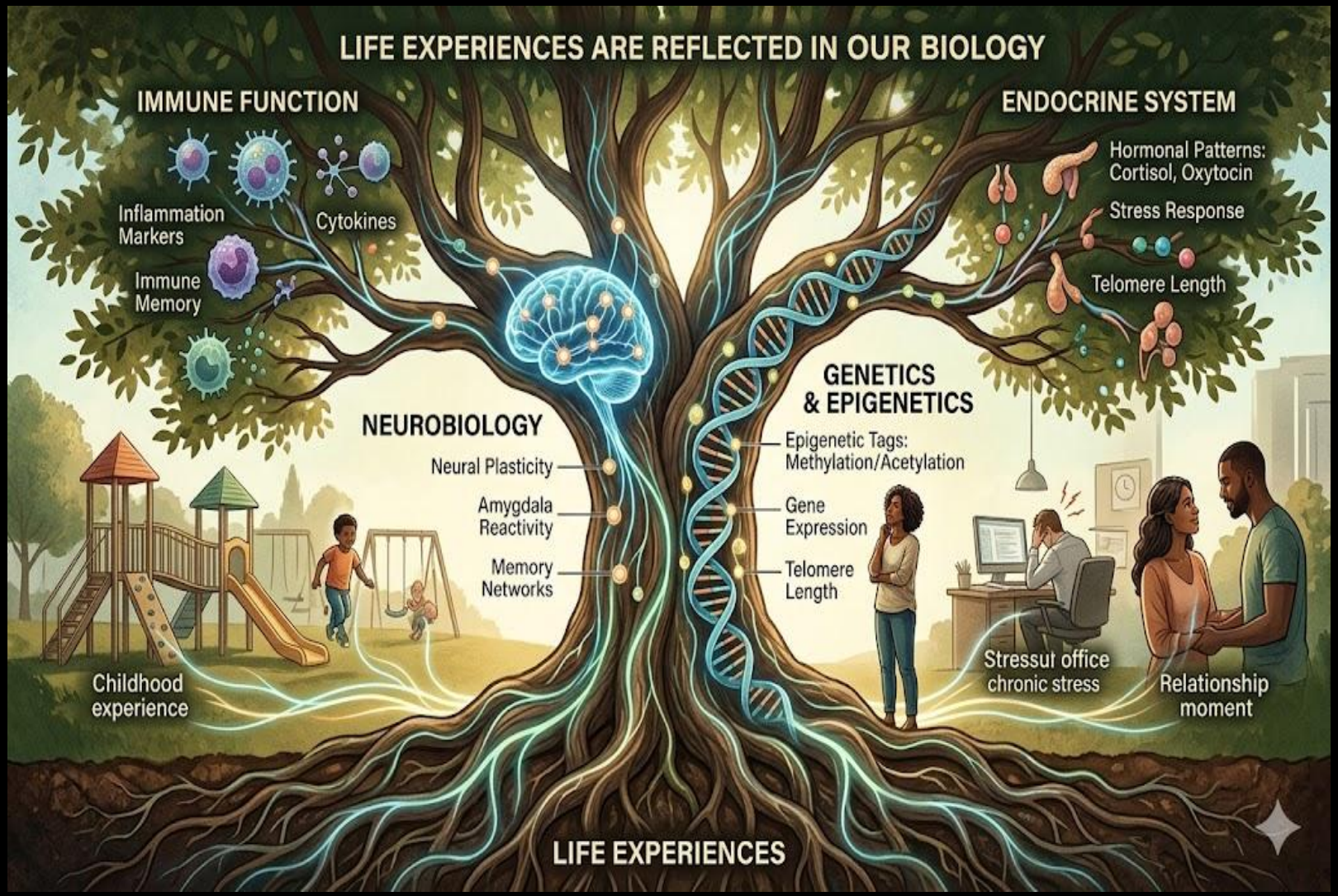


The difference between a reaction and a response



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- Our life experiences are reflected in our biology!



Crying is Rinsing and Healing!

- Mitigates armoring
- Alleviates excess cortisol





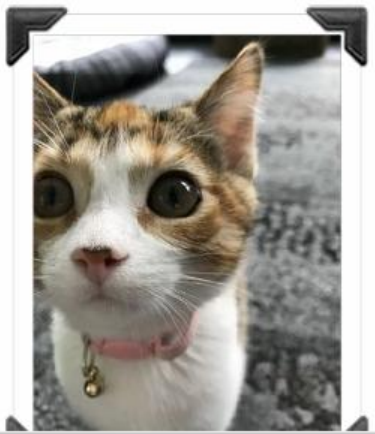
Animal Regulation Cards



Inspired by the true habits of animals these cards have been designed to guide co-regulation activities based in sensory stimulation. After students become familiar with these exercises they can be used as self-regulation tools as well.















Let's Have a Cup of Coffee
This is Discipline

- Rituals
- Connects us to one another
- Creates safe trusting environment
- Family Privilege
- Tangible and personal

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Neuroscience Reveals Being Yelled At Triggers Same Brain Regions As Physical Pain Yet Millions Of Parents Still Treat It As Normal Discipline This Is Not Tough Love But Trauma Wiring Happening In Real Time Explaining Why Voice Tone Shapes Children More Than Most People Realize


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BUTLER | COLLEGE of EDUCATION GRADUATE PROGRAMS

Online Master of Education in Trauma Responsive Teaching and Leadership

LEAD WITH INSIGHT. RESPOND WITH IMPACT.

In Butler University's online MEd in Trauma Responsive Teaching and Leadership program, you will prepare for career advancement by studying leadership principles, trauma-informed instruction, nervous system development, and more. This program features a curriculum developed in collaboration with industry partners such as the Crisis Prevention Institute (CPI). Additionally, alumni from Butler's Applied Educational Neuroscience Certificate program can apply credits to save time and money.

A PRACTICAL CURRICULUM, BUILT TO OPEN DOORS

Coursework in the online MEd in Trauma Responsive Teaching and Leadership program is focused on educational neuroscience, exploring how trauma and adversity can impact the developing nervous system and affect behavior. Throughout your 20-month program, you will complete five asynchronous courses, four courses with optional synchronous meetings, and one elective in a modality of your choosing.

REQUIRED COURSES

ED 455	Research, Strategies and Principles of Education Neuroscience – 3 CREDITS
ED 456	Informed Trauma and Brain Instruction / Social and Emotional Learning – 3 CREDITS
ED 457	Trauma & the Brain Integrated into Educational/Behavioral Practices & School Leadership Practicum – 3 CREDITS
ED 510	Principles of Trauma-Responsive Leadership – 3 CREDITS
ED 513	Trauma-Responsive School Discipline – 3 CREDITS
ED 610	Seminar in TRTL: Adult Nervous System Health/Wellbeing – 3 CREDITS
ED 611	TRTL Seminar: Youth Nervous System Health/Wellbeing – 3 CREDITS
ED 673	Research in Human Services – 3 CREDITS
ED 682	Capstone in TRTL – 3 CREDITS
Elective	General Elective – 3 CREDITS

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WHAT SETS US APART

Real-World Application

Flexible practicum in your current setting plus an applied capstone.

COURSEWORK

The trauma response training you need to grow in your current position or open doors to new opportunities.

FACULTY

Led by experienced professionals across education, mental health, and social services.

AFFORDABILITY

Quality education at an affordable cost. Apply up to 9 transfer credits.

Connect With Me

- To understand our neurobiology is to know the secret of life!
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- Desautels_phd – twitter
- Instagram – lori.Desautels
- Linked In- https://www.linkedin.com/in/lori-desautels-a5b65016/

- Who are YOU?" said the Caterpillar.
- This was not an encouraging opening for a conversation.
- Alice replied, rather shyly,
- "I-I hardly know, sir, just at present - at least I know who I WAS when I got up this morning, but I think I must have been changed several times since then."

  - Alice's Adventures in Wonderland, Lewis Carroll

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When adults become aware of their nervous systems, they can recognize their emotional triggers or activators, sense the dysregulation in their bodies and brains, and respond accordingly. This allows adults to lean into curiosity when encountering a dysregulated child, empowering them to respond with compassion and connection over control, escalation, and compliance.

Body and Brain Brilliance, a neuro-educational manual for social and emotional development embracing all ages, as well as educator nervous systems, will address the science and the language of our nervous systems as educators and students learn together.

"Body and Brain Brilliance' is a deeply insightful resource that shows us how to honor the space between adult and child in a way that offers connection, healing, and growth. It raises the voices of all young people by bringing science and compassion to the way we understand behavior and respond. This beautifully written book is brimming with essential wisdom and practical strategies that open the way to respectfully and tenderly support all young people. Thank you for writing this. It's truly fabulous."

-KAREN YOUNG, Psychologist

"Accessible, practical, and transformative, Body and Brain Brilliance guides educators and administrators to provide the regulated, positive repeated experiences students need to thrive. By showing how to keep our own nervous systems in mind, shift our own states, and then co-regulating with our students, Desautels provides a roadmap for how to effectively hold our students' nervous systems in mind, even in the most challenging moments, where students are most vulnerable."

-TINA PAYNE BRYSON, LCSW, Ph.D., New York Times Bestselling
Co-author of *The Whole-Brain Child & No-Drama Discipline*

"I've had the honor of reviewing early chapters, and it is packed full of activities to soothe our nervous systems and co-regulate with children. Add Body and Brain Brilliance to your summer reading list to prepare for back-to-school!"

-BETH TYSON, Childhood Trauma Consultant



You can find *Dr. Desautels'* videos, latest research, and resources at **www.revelationsineducation.com**

Body and Brain Brilliance

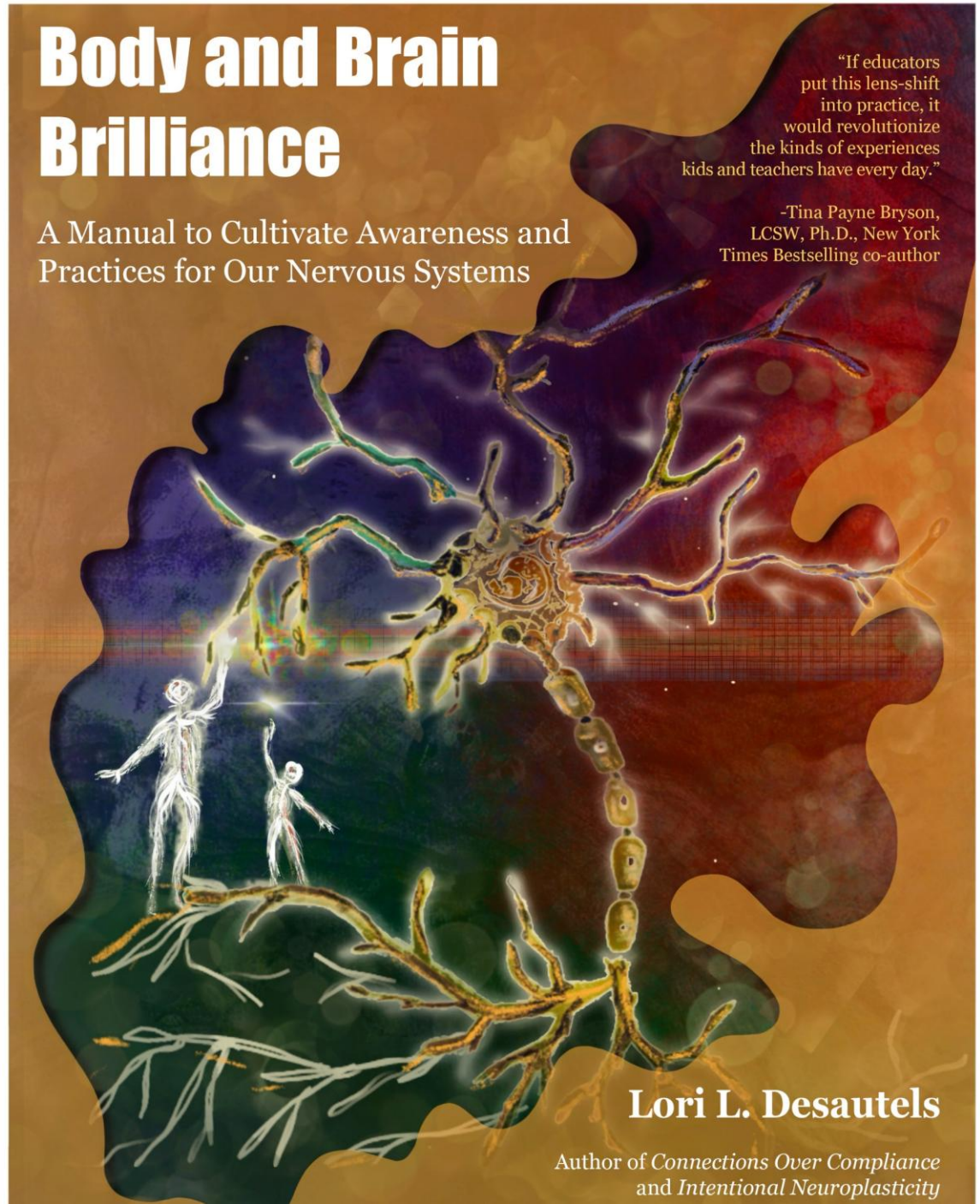
Desautels

Body and Brain Brilliance

A Manual to Cultivate Awareness and Practices for Our Nervous Systems

"If educators put this lens-shift into practice, it would revolutionize the kinds of experiences kids and teachers have every day."

-Tina Payne Bryson, LCSW, Ph.D., New York Times Bestselling co-author



Lori L. Desautels

Author of *Connections Over Compliance* and *Intentional Neuroplasticity*

Educator fatigue and burnout are at an all-time high. Students are carrying their mental and emotional exhaustion into the classroom.

Intentional Neuroplasticity explores the plasticity of the brain and nervous system, while learning how adversity and trauma impact a student's developing nervous system to affect behaviors—which ultimately changes the way educators approach discipline and engagement.

When we empower and relieve our nervous systems with the language of science and deepened understanding of why we sense, feel, and behave the ways we do, we are preparing for a lifetime of possibility through the knowledge of brain and body architecture and plasticity.

"This book will undoubtedly transform the way in which you view the emotional state of our children in a school environment. The practical strategies provided—for how to support the emotional well-being of children—are unparalleled. Dr. Desautels beautifully distills our current understanding of neurobiology and provides teachers with the tools necessary to more compassionately engage with their students."

—**Christine M. Crawford, MD, MPH**, Associate Medical Director, Research, Support and Education, National Alliance on Mental Illness (NAMI)

"Dr. Desautels captures the essential elements of Interpersonal Neurobiology and its application in the classroom and beyond. Very much recommended!"

—**Lou Cozolino, Ph.D.**, Author of *The Social Neuroscience of Education* and *Attachment-Based Teaching*

"Dr. Desautel has interpreted vital learnings from decades of research into the neurobiology of trauma, into friendly, engaging messages and by sharing an abundance of creative resources and ideas that are so relevant and so needed in classrooms today!"

—**Dr. Judith Howard**, Associate Professor in Trauma-Aware Education, Queensland University of Technology, Australia

"Every chapter connected how we as educators can utilize science to ensure that our students experience safe, stable, nurturing relationships and environments, which are the keys to successful classrooms and schools."

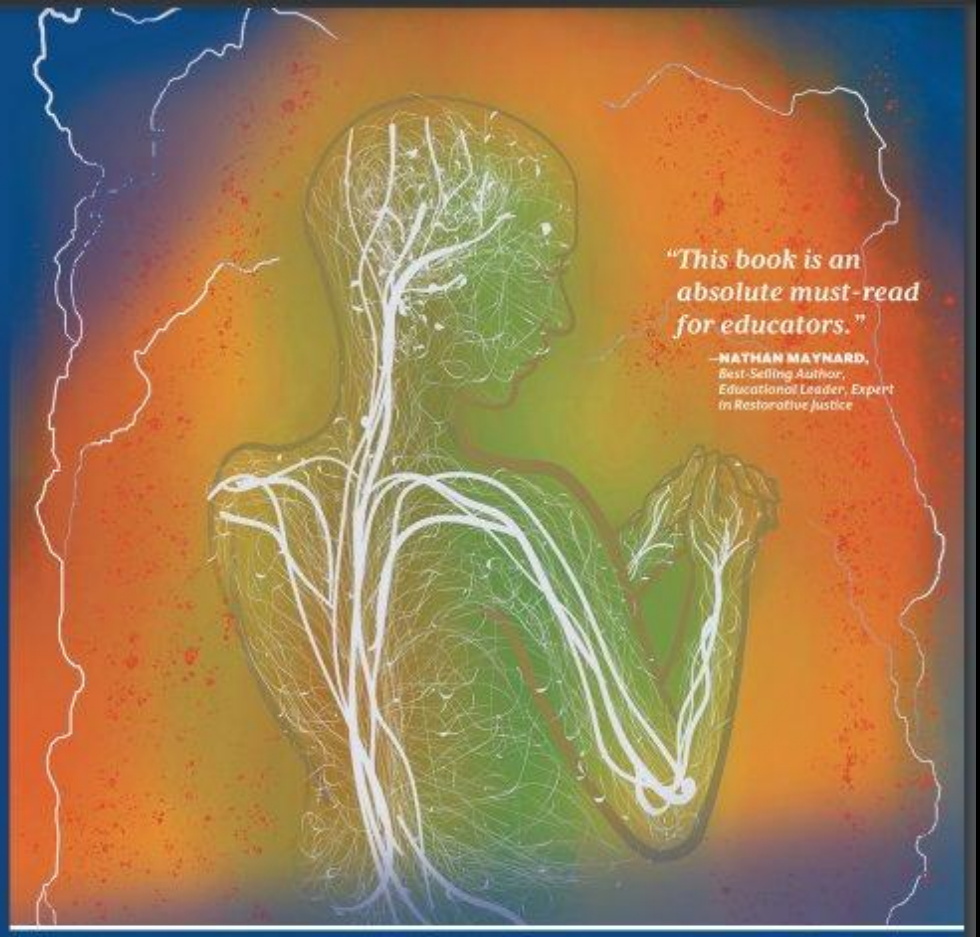
—**Mathew Portell**, Founder of the Trauma Informed Educators Network

Lori Desautels, Ph.D., is a teacher, not a neuroscientist—she knows that the translations and applications from the affective, developmental, social, and relational neuroscience research are critical to educational practitioners now more than ever. No one could have been prepared for the emotional and social losses, challenging behaviors, and dysregulation that are impacting the well-being of our students during the past few years—our collective nervous systems feel the tension and unrest. *Intentional Neuroplasticity: Moving Our Nervous Systems and Education System Toward Post-Traumatic Growth* can provide educators cutting-edge information, practices, tools, and exercises to regulate and empower themselves and their students for resiliency and success!
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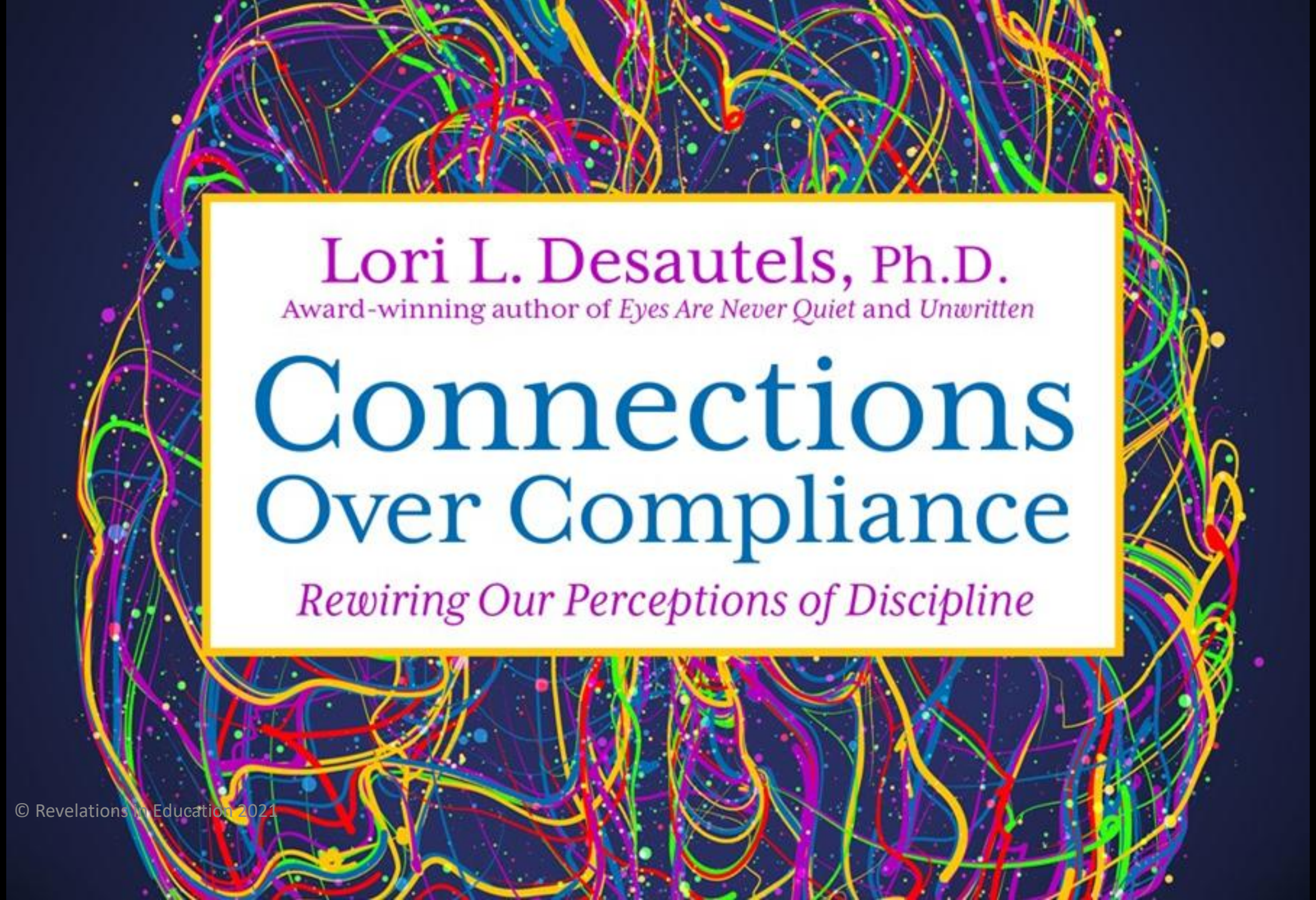
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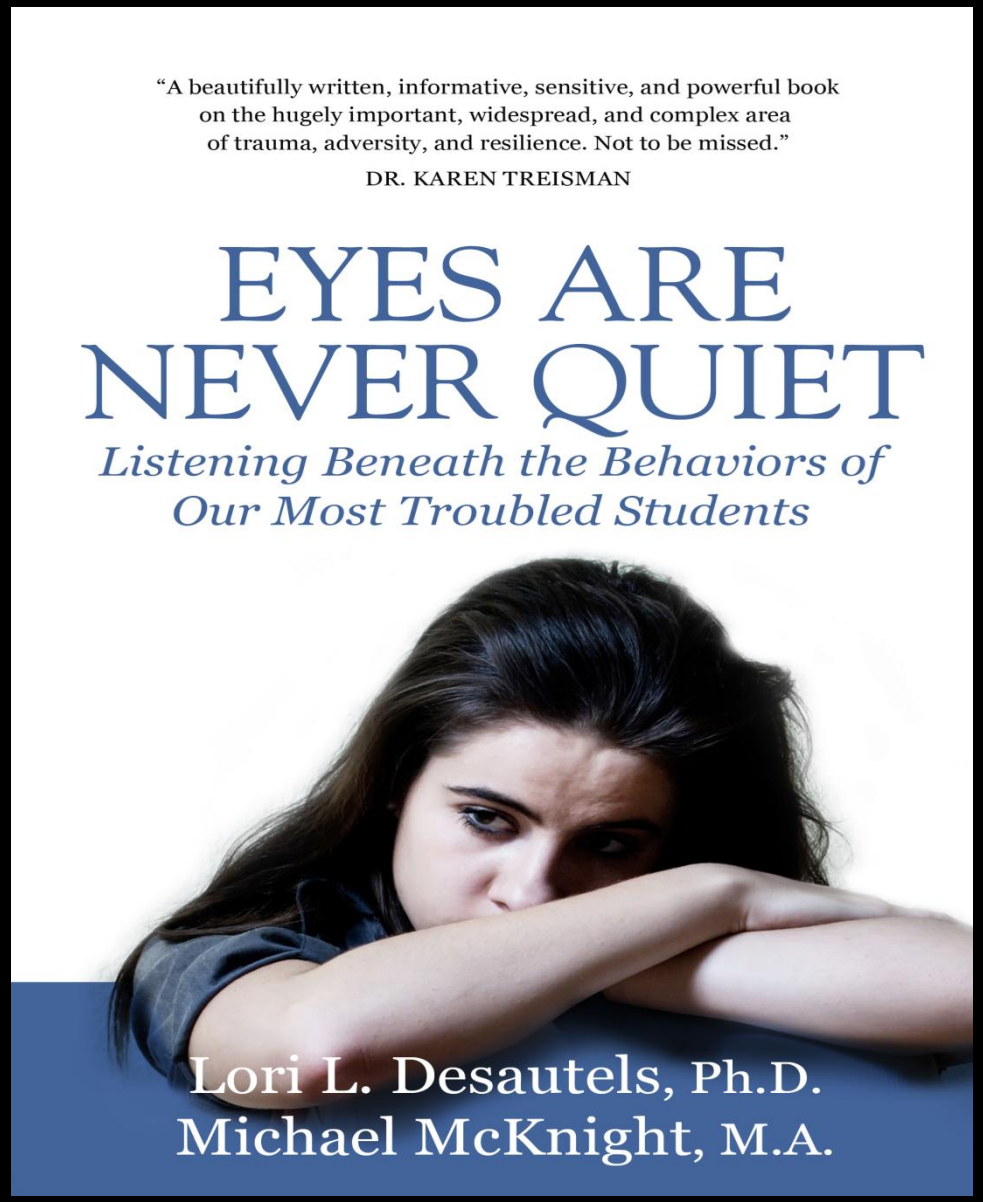
AUTHOR OF *Unwritten*, *Eyes Are Never Quiet* and *Connections Over Compliance*

Intentional Neuroplasticity

Moving Our **NERVOUS SYSTEMS** and **EDUCATIONAL SYSTEM** Toward **POST-TRAUMATIC GROWTH**



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