

Applied Educational Neuroscience *for Parents*

A practical framework for breaking generational cycles of trauma, harnessing the power of our nervous systems, and supporting family well-being.



Introduction

Dear Parents,

Thank you for your commitment to learning more about the Applied Educational Neuroscience (AEN) framework, developed by Dr. Lori Desautels. By opening this guidebook, you're taking a powerful and intentional step toward nurturing your nervous system and supporting your family's well-being.

My name is Jessica Herzog-Hall. I am an educator, trauma-informed advocate, and a lifelong learner dedicated to helping others understand how trauma shapes the brain and body. I teach how early life experiences leave lasting imprints and how we can foster healing, resilience, and connection in ourselves and the children we care for. Above all, I am a proud mother to two incredible children.

When my son was born, I was shocked by how unprepared I felt, despite doing everything "right." I read all the parenting books, attended classes, and planned meticulously. Still, when I became a mother, I was completely lost. Parenting in today's world is nothing short of heroic. The challenges we face (ie mental health struggles, gun violence, systemic inequality, poverty, addiction, etc) can feel completely overwhelming. Many of us are simply trying to stay afloat. The AEN framework is the lifeline we've been searching for.

Originally developed for schools, AEN empowers educators and students to understand their nervous systems, embrace co-regulation, and rethink how we approach discipline. Under the leadership of Dr. Lori Desautels, the AEN team, and the passionate graduates of the certification program, this work continues to expand. As I progressed through the certification program at Butler University, it became abundantly clear: this framework is just as essential for parents.

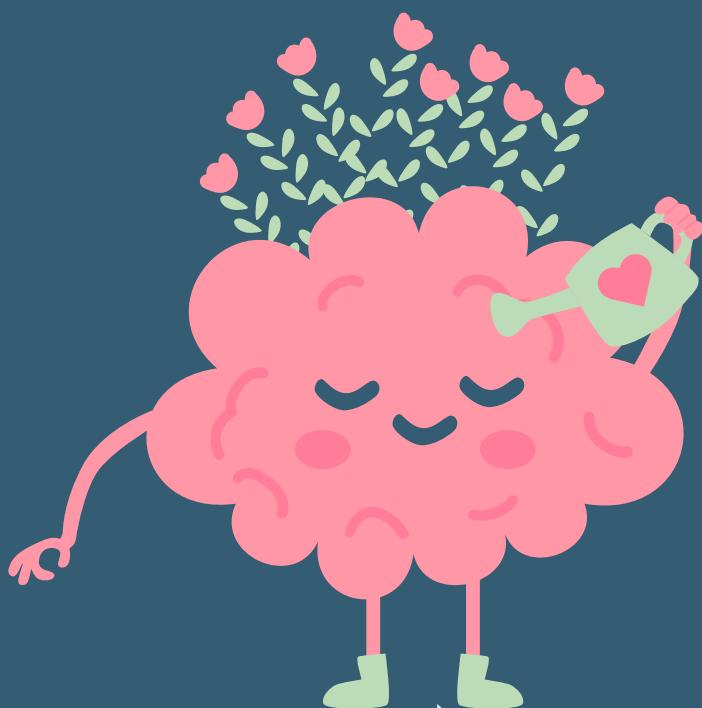
In the pages ahead, you'll explore the science and soul of Applied Educational Neuroscience, why our nervous systems matter, how to co-regulate with our children, build genuine connection in a disconnected world, and develop practices that nourish emotional, physical, and relational well-being. This work begins within us. It is reflected in every interaction we have with our children, our partners, and communities. Thank you for showing up. Thank you for your courage to disrupt generational patterns and create a safer, more compassionate world for the next generation.

Warm regards,



Jessica Herzog-Hall, MSW

Applied Educational Neuroscience
Certificate- Cohort 9



The 4 Pillars of Applied Educational Neuroscience

The diagram illustrates the '4 Pillars of AEN' (Adult Nervous System Engagement). It features four circular nodes arranged in a diamond pattern, connected by dashed lines. The top-left node is light blue and contains the text 'The Adult Nervous System'. The top-right node is light red and contains 'Co-Regulation'. The bottom-left node is light green and contains 'Touch Points'. The bottom-right node is light orange and contains 'Language of our Nervous Systems'. The center of the diamond is a large, bold text 'The 4 Pillars of AEN'.

**The Adult
Nervous
System**

Co-Regulation

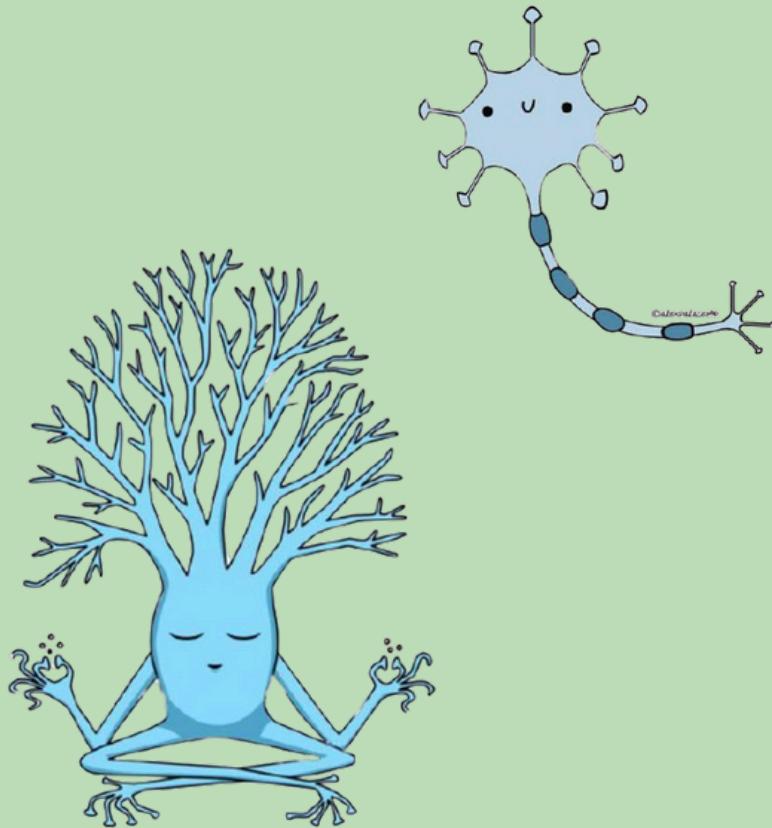
Touch Points

**Language of
our Nervous
Systems**

These four pillars work together to support the adult and child nervous system. By parents bringing awareness to co-regulation, relational touch-points, and our physiology, we can build environments where both parents and children feel seen, safe, and supported.

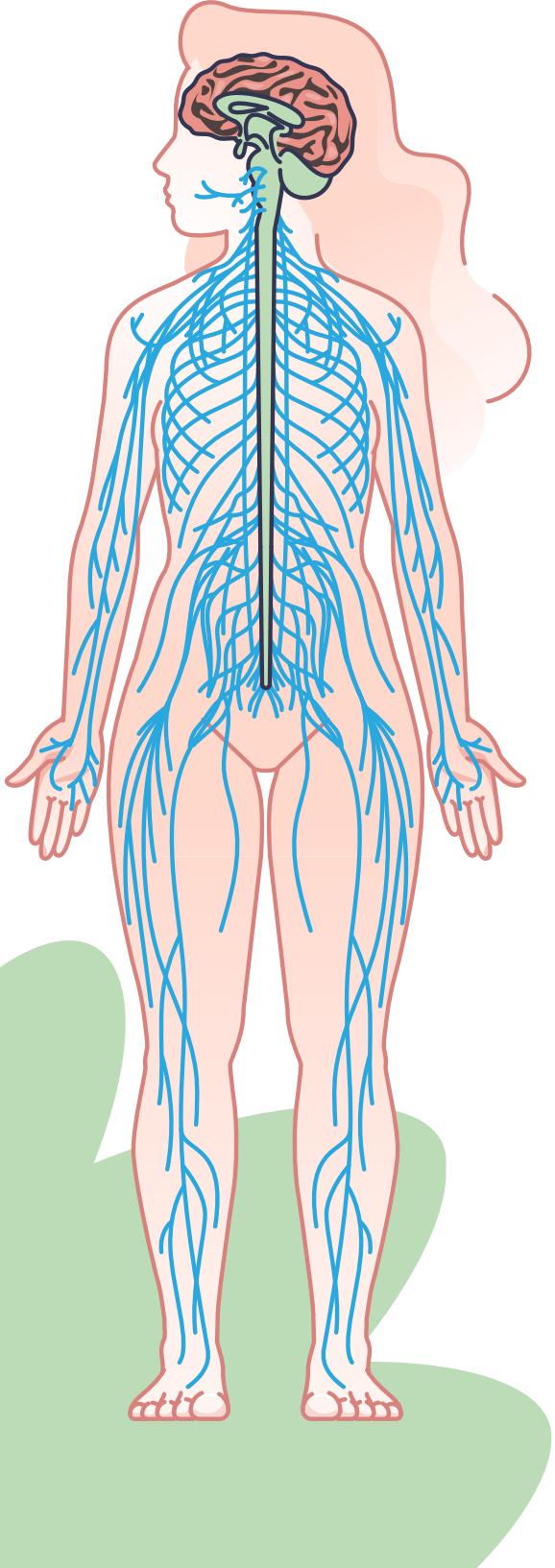
The Adult Nervous System

Hey dad what
are you doing ?



The Adult Nervous System

Supporting our children's behavior starts with us. As parents, our own nervous systems set the tone. When we bring awareness to our nervous system states, we create the safety our children need to be calm and connected.

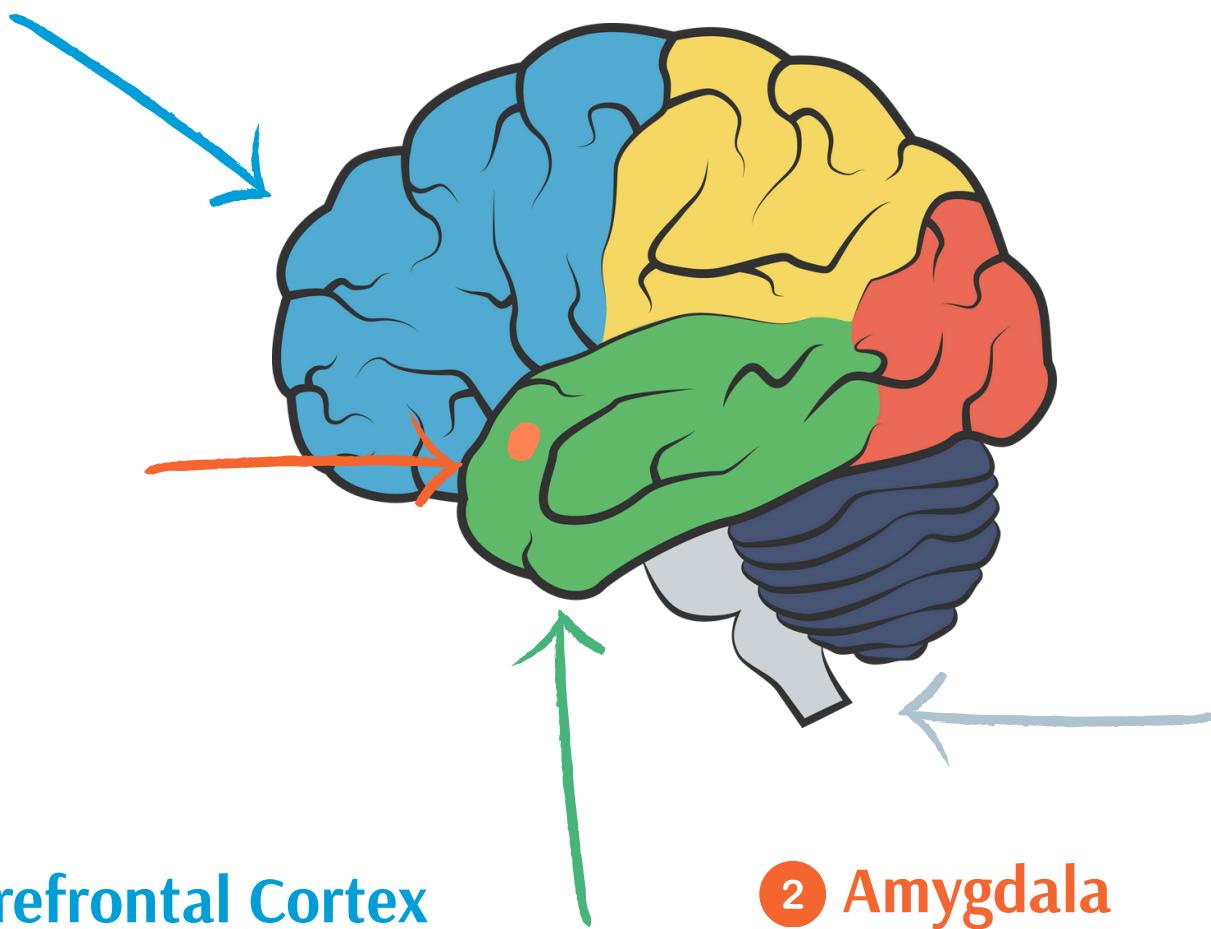


Our nervous system is like our body's built-in alarm system. It helps us make sense of the world around us. In a matter of seconds, it takes in sights, sounds, smells, and more. It then decides how we should respond with the main goal of keeping us safe and alive.

When we begin to understand how our brains and bodies are hardwired for survival-especially through the lens of generational adversity and life experiences, we start to see our own responses (and our children's) in a whole new light. This can help us respond with more compassion, curiosity, and calm.

In this section, we will breakdown the three main areas of the brain that help us think, feel, and react. The brainstem, limbic system (including the amygdala), and the prefrontal cortex. These parts of the brain work together to manage everything from basic safety to our emotions, thoughts, and behaviors.

The Amazing Brain



1 Prefrontal Cortex

Our executive functions live here! Decision-making, emotional regulation, working memory, sustained attention, problem-solving, social engagement, and more.

3 Limbic System

Our limbic system helps us feel and sense our inner and outer environments. It helps us detect threat and safety.

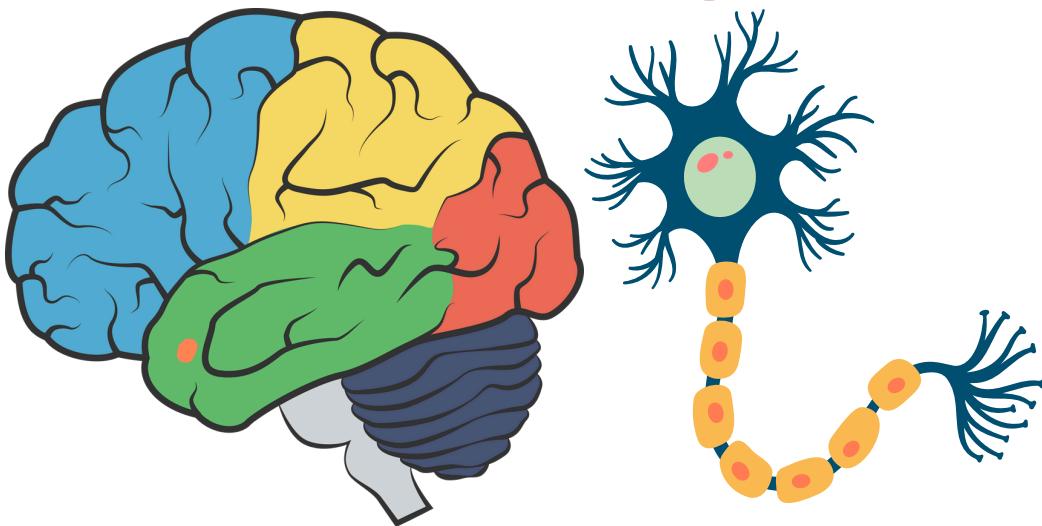
2 Amygdala

Our amygdala is housed in the limbic system and assists us with our fight or flight response. It also helps us with negative and positive emotions.

4 Brainstem

Our brainstem is the oldest part of our brain! It helps us with our heartbeat, breathing, digestion, and it's where our freeze or “shut-down” response.

The Amazing Brain



As parents, it's incredible (and a little overwhelming) to realize that our children are born with around 100 billion neurons. From birth to about age two, their brains are developing at a breathtaking pace—forming up to 700 new neural connections every second. This early period is a critical window for brain development, where every experience helps shape the way their brains are wired.

The everyday moments we share—feeding, soothing, singing, making eye contact, are more than just routines. They're actually strengthening those neural pathways, helping our little ones learn how to eat, sleep, speak, and connect. However, it's also important to understand that if these early experiences involve consistent stress or adversity, the brain is forced to adapt to that, too. These kinds of stressors can impact how the nervous system functions long-term.

The good news? Our brains don't stop growing after childhood. In fact, they continue developing throughout our lifespan. The brain is a lifelong learner—constantly forming new connections and reshaping old ones. This ability to change and adapt is called **neuroplasticity**, and it's one of the most beautiful aspects of being human. It means that healing is always possible. We can shift how we respond to stress, change old thought patterns, and even rewire the way we parent.

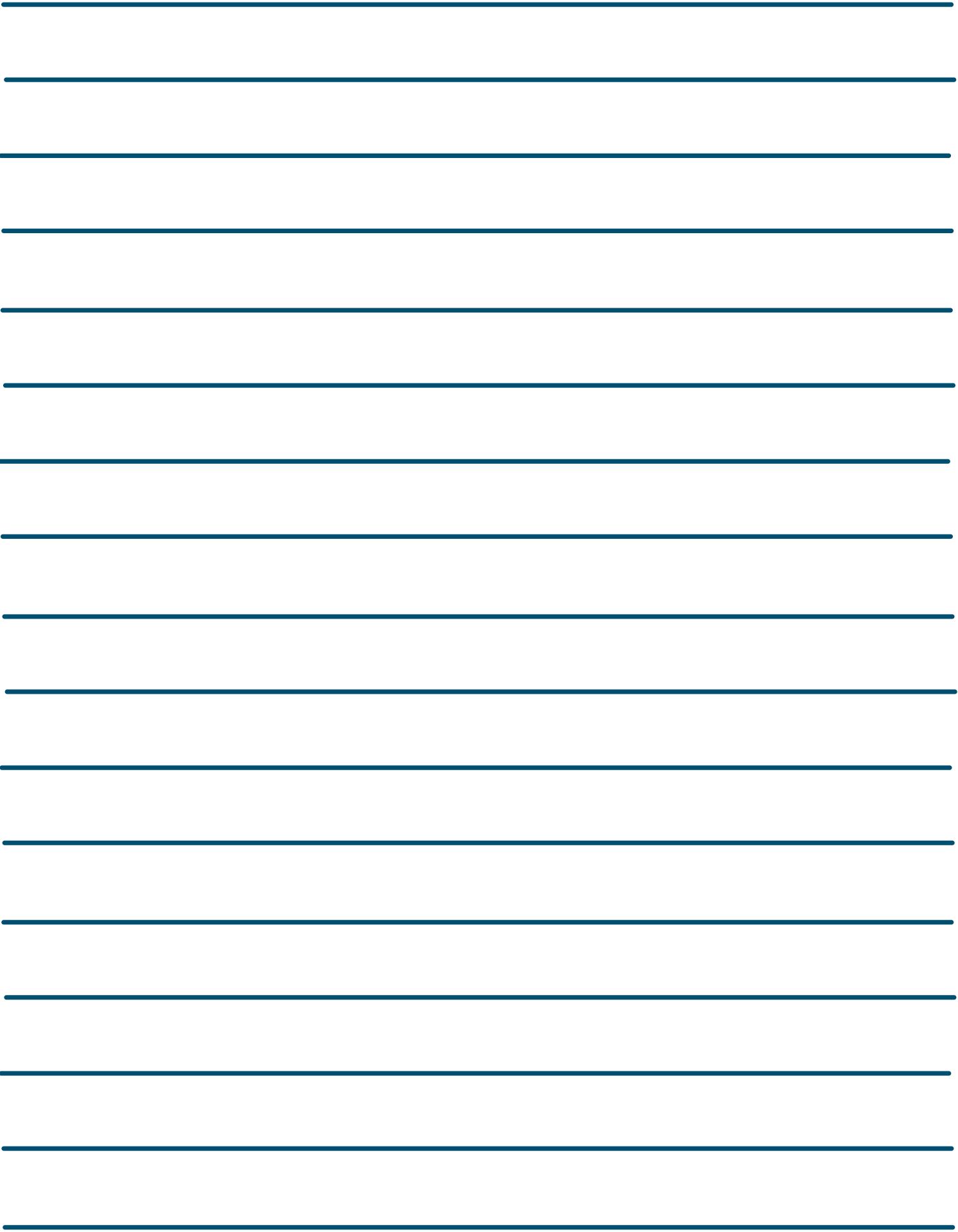
That said, it's not always easy. As parents, we often find ourselves confronting patterns from our own childhoods. We carry the imprints of our past—sometimes known as “ghosts in our genes.” Parenting can bring all of this to the surface, especially if we grew up with inconsistent, neglectful, or harmful caregivers. In many cases, we’re doing the hard, brave work of re-parenting ourselves while raising our children. It can be challenging to face these old wounds however, when we begin to connect with our inner child we are not only supporting our own healing, we are breaking generational cycles of harm.

Learning Touch-Point



As we reflect on our own childhoods and the ways those experiences have shaped how we parent today, let’s take a moment to honor our personal journeys. Think about your younger self—the child you once were. With all that you know now, what would you want to say to that child? What words of comfort, encouragement, or strength would you offer? Take a few minutes to write down your thoughts. Try to focus on the resilience, courage, and strength your inner child had—even through times of adversity.

Writing space on the next page



Autonomic Nervous System

Autonomic Nervous System (ANS)



Sympathetic Nervous System

Prepares the body for the fight or flight response

Parasympathetic Nervous System

Relaxes the body and slows high energy responses

Our autonomic nervous system is a branch of the peripheral nervous system, and it's responsible for many of the body's automatic functions (ie heart rate, breathing, and digestion). It also plays a huge role in how we respond to stress and how we calm down afterward. This system is divided into two parts

- The **Sympathetic Nervous System**- Triggers our fight or flight response when we sense danger or stress.
- The **Parasympathetic Nervous System**- Helps us with “rest and digest”, bringing the body back into a state of calm.

As parents, understanding these systems can be incredibly helpful. When we're overwhelmed, anxious, or reactive, it's often our sympathetic nervous system kicking in. The same is true for our children- tantrums, meltdowns, and shutdowns can all be signs of a nervous system in distress searching for ways to connect. By learning to recognize these states in ourselves and our kids, we can respond with more empathy and intention. We can also begin to use strategies that help everyone in the family feel more regulated, safe, and connected.

In 1994, Dr. Stephen Porges introduced the Polyvagal Theory. This theory dives into the role of our autonomic nervous system and how it assists us in regulating our health and behavior. The theory breaks down our autonomic nervous system into three parts.

- **The dorsal vagal system-** Assists us in the “shut-down” response when we meet danger or threat
- **The sympathetic system-** Assists us with our fight or flight response when we meet danger or threat
- **The ventral vagal system-** Assists us with social connection , and felt safety in our internal and external environments.

Our nervous system has evolved from the needs of our ancestors, prioritizing our safety and survival. While the stressor we face today (ie traffic, deadlines, or parenting challenges) may look very different from the dangers of the past, our nervous system still responds in the same way. Our brains and bodies are constantly working together. Although it may not feel that way, especially in tough parenting moments.

On the next page, you can see the three main states of the nervous system and what kinds of behaviors we might see in ourselves and our children when we're in each state. Our nervous system can shift and blend these states throughout the day, depending on what is going on around and inside of us.

Many challenging moments in parenting (ie yelling, shutting down, or feelings of overwhelm) are not signs of failure or bad parenting. They are signs of our nervous systems being dysregulated. The same is true for our kids when we see challenging behaviors (ie hitting, screaming, meltdowns or withdrawal). When you combine that with an undeveloped brain, we can really start to see the importance of tools to support regulation. The goal is not to be regulated 24/7 (that is impossible). Instead, the goal is to bring **awareness** to our nervous system state and identify when it's asking for some help. Then we can bring in simple tools to help calm our nervous system. By doing this, we are building long-term emotional resilience, safety, and connection especially in our children.

Learning Touch Point



What everyday stressors cause your nervous system to become dysregulated? What tools (if any) have helped you get back to a state of calm (ie deep breathing, meditation, mindfulness etc). It is okay if you do not know yet, that is what AEN is all about! We will be breaking down some of these tools in a few pages.

Nervous system ladder

@innvglowtherapy



Ventral Vagal Activation

We feel calm, connected & present

We have thoughts of "I got this" & seek connection.

Sympathetic activation

We feel high, intense emotions, overwhelmed, panicky & irritable

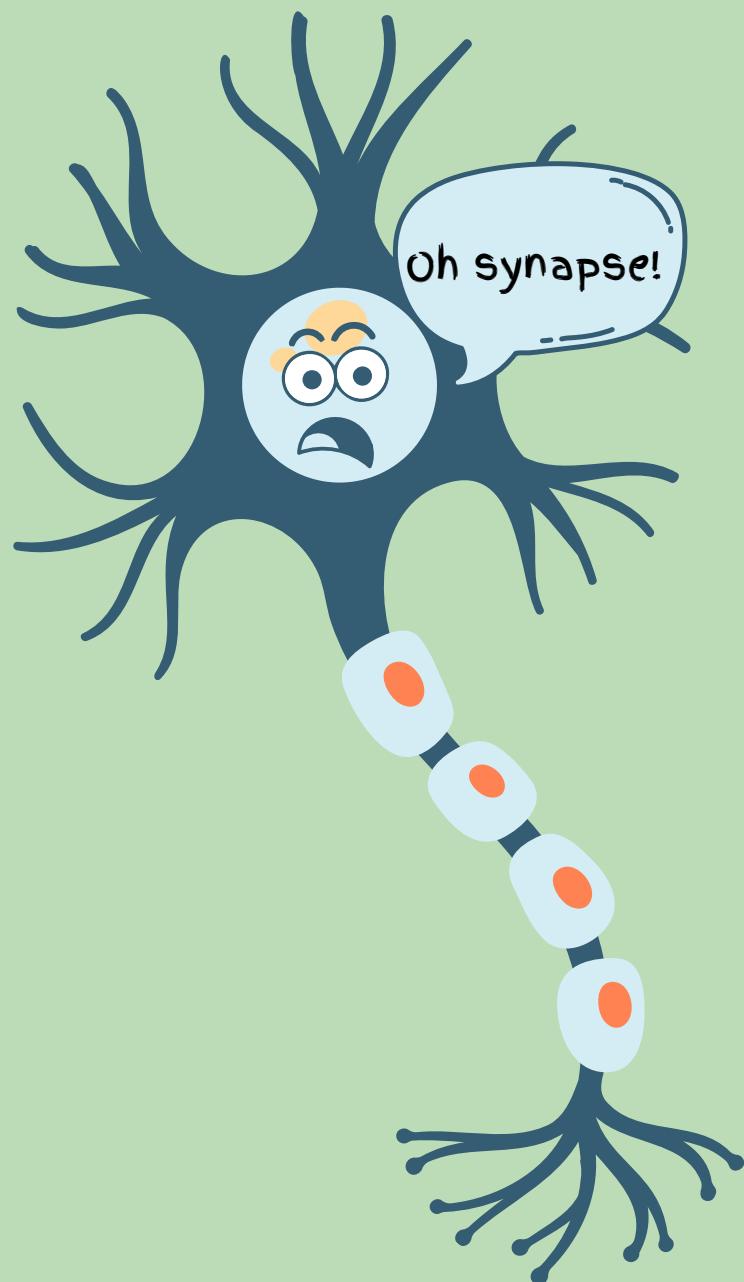
We think "people are out to get me" "the world is dangerous."

Dorsal vagal activation

We feel disconnected, dissociated, numb, low, shame

We think "what's the point" & "I'm all alone"

Language of the Nervous System



Language of the Nervous System

When we understand that negative behaviors are signals that our nervous system is dysregulated, we and our children can start to feel empowered. Sharing in this learning with our children can build connection and resilience.

How to Support Yourself and Your Child Through Every Nervous System State

The Sympathetic Nervous System (Fight or Flight Response)

What it Can Look Like

For Parents: yelling, irritability, racing thoughts, feeling “on edge.” Feeling sensations like tension, tiredness, restless etc.

For Kids: tantrums, running away, hitting, defiance. Feeling sensations like tightness, heat, queasiness, teary etc.

What Can Help

Movement: dancing, walking, jumping, shaking

Deep breathing: Breathing in through your nose and blowing out through your mouth. Try smelling a flower, blowing out a candle with kids

Naming it: “I am feeling dysregulated, I think I need a moment to calm down.” “I am noticing you are feeling frustrated, can we take some deep breaths together?”

Connection: Eye contact, warm tone, getting down to their level, sitting nearby without forcing them to talk and explain.



The Dorsal Vagal State (Freeze/Shutdown)

What it Can Look Like



For Parents: numbness, zoning out, feeling stuck, emotionally disconnected, disassociated, doom scrolling. Sensations like depression, burnout, frozen.

For Kids: withdrawal, silence, refusing to engage, very quiet. Sensations like trapped, tired, panicky, achy, afraid.

What Can Help

Gentle sensory input: warm tea, cozy blanket, soft lightening, rubbing hands together, or a quiet environment

Connection without pressure: “I’m here when you’re ready” or sitting near them without talking. Baby steps: Encouraging tiny actions- standing up, drinking water, rubbing hands together, or taking a deep breath.

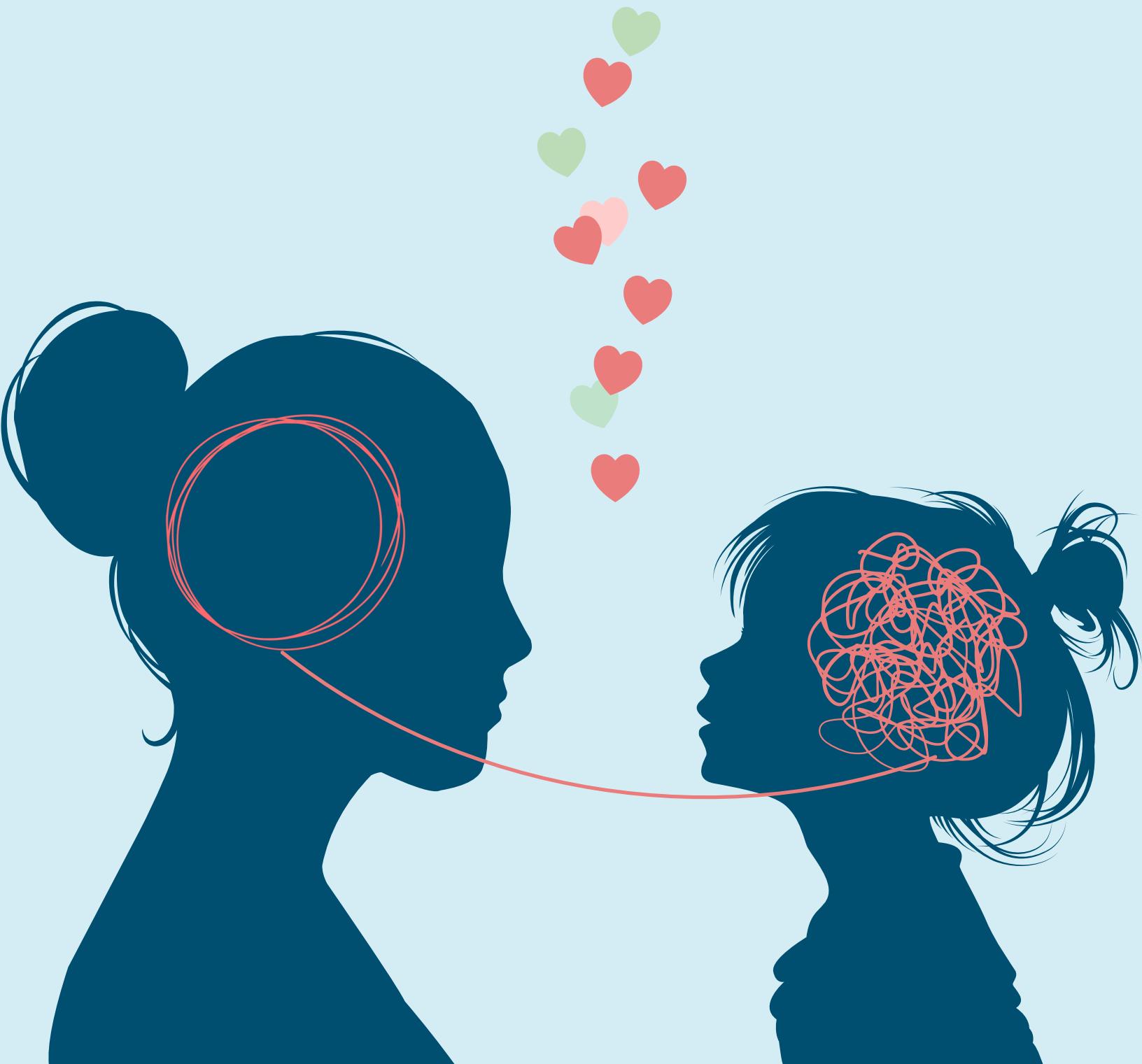
Compassionate Self-talk: “I am not lazy, my nervous system needs a break” or “I do not have to get everything done, sometimes my body needs a moment to breath.”

Parent Tip

As Dr. Stuart Shanker explains in his book “Self-Reg,” just because a child is quiet does not mean their nervous system is calm.

Technology use can cause our nervous systems to be very dysregulated and can cause long-term changes to our brains. If able, try to remove technology use for a few days. Notice changes in behaviors and nervous system states.

Co-Regulation



Co-Regulation

Children are deeply attuned to our emotional states—often sensing our feelings before we speak. When we offer a calm, emotionally available presence, we can create a safe space. When children borrow from our calm during moments of overwhelm, this process is called co-regulation. It is often nonverbal and rooted in things like: our tone of voice, body language, and the way we connect.

Co-regulation is the process by which we help our children to manage their emotions by staying calm, connected, and present. In early childhood, when a child's brain and nervous system is still developing, they rely heavily on the adults around them. Adults can help the child navigate big feelings and overwhelming experiences. Children cannot regulate on their own yet, which means our role as parents is critical.

Think of co-regulation like being an anchor. When a child is feeling dysregulated it is like they are going through a storm with no visibility. Our nervous systems, when steady and grounded, becomes their anchor. They borrow from our calm to begin feeling safe again. This does not mean we need to be perfectly regulated all the time. It simply means we need to stay emotionally available, even if we are feeling challenged too.

Children do not learn to self-regulate alone. It is through repeated experiences of being soothed by a caring adult. For parents trying to break generational cycles, co-regulation offers a powerful opportunity for what we may not have received as children. Co-regulation helps children learn that their emotions are not too big or too much. That we can work through things together.



How to Practice Co-regulation

Stay Present- Sit close, get down to their level, and offer your presence without trying to fix or rush their feelings.

Use a soft and calm tone- Children need this when dysregulated.

Breath slowly and deeply- Kids will mirror our breath. Taking slow, deep breaths can guide them to a calmer state (and help your regulation as well).

Offer gentle touch (if welcome)- A hand on the back, hug, or hand hold can be grounding for some children. Some may not want to be touched and that is okay!

Validate & Support- “I see you are feeling _____, that is completely valid, I am right here with you when you are ready.” “Sometimes feelings can be really overwhelming, do you want to take a deep breath together?”

Being a safe, grounding force for your child does not mean you never feel overwhelmed, frustrated, or unsure. In fact- parenting often brings out these feelings daily. There will be moments when you find yourself just as dysregulated as your child. **That is completely normal.** What matters is that you acknowledge it, and guide yourself back. Taking a deep breath, stepping away if you need a moment, or even saying “I am having a hard time too, but I’m here, and we will get through this together,” can be incredibly regulating for both of you.

This will not look perfect every time. If things do not go well, you always have the opportunity to come back, reconnect, and model what it looks like to take responsibility for your emotions. Remember, your nervous system is doing its own work too. This process takes courage, patience, forgiveness, and compassion. Some days our presence alone is enough. We just have to keep showing up, one deep breath at a time.

Touch Points



Touch Points

Touch points are micro-moments of connection. These often occur through facial expressions, tone, greetings, validation, and deep active listening.

Touch points occur intentionally and authentically between two individuals. They help us express safety and validation. As children learn how to navigate their emotions and nervous system states, they will continue to encounter challenges. It is incredibly important that children feel seen and understood. It can sometimes be as simple as making eye contact and giving a smile or connecting through play or areas of interest.

Examples of Touch Points in Everyday Parenting

Morning Connection: Gently placing a hand on your child's back while saying "Good Morning, I am so happy to see you. How did you sleep?" This touch point helps to start the day with warmth and security.

Getting Down to Their Level: Kneeling down to your child's level, making eye contact and saying "That was really hard. I am here" or "I know that was challenging but, we can do hard things!"

Validating Big Emotions: Saying, "It's okay to feel _____. I get that. I am here with you," while being close to them helps create space for emotional processing.

Shared Laughter: Engaging in a silly voice, inside jokes, or imaginative play. When we join our child in their world it helps build connection and calm.

After School Check-in: Notice how they seem when they walk in. For example, if your child looks tired perhaps saying "I noticed you look tired, want to sit together for a bit before telling me how school was?"

Bedtime Connection: Take some time before bedtime to help your child's nervous system begin to calm. Reading books, practicing deep breathing, saying goodnight to our bodies are great ways to signal to our nervous system that we are ready to rest.

Putting AEN into Practice



Putting AEN into Practice

A New Lense on Discipline and Consequences

The Latin root of the word *discipline* means “to teach” or “to learn.” Yet, in many families, discipline is often used in a way that does not reflect this original meaning. As Dr. Lori Desautels explains in her book *Body and Brain Brilliance*, “Sadly, over time, the word discipline has developed punitive connotations, as it is often associated with consequences and punishments.” She further explains that harsh discipline is often counterproductive, especially for a developing nervous system.

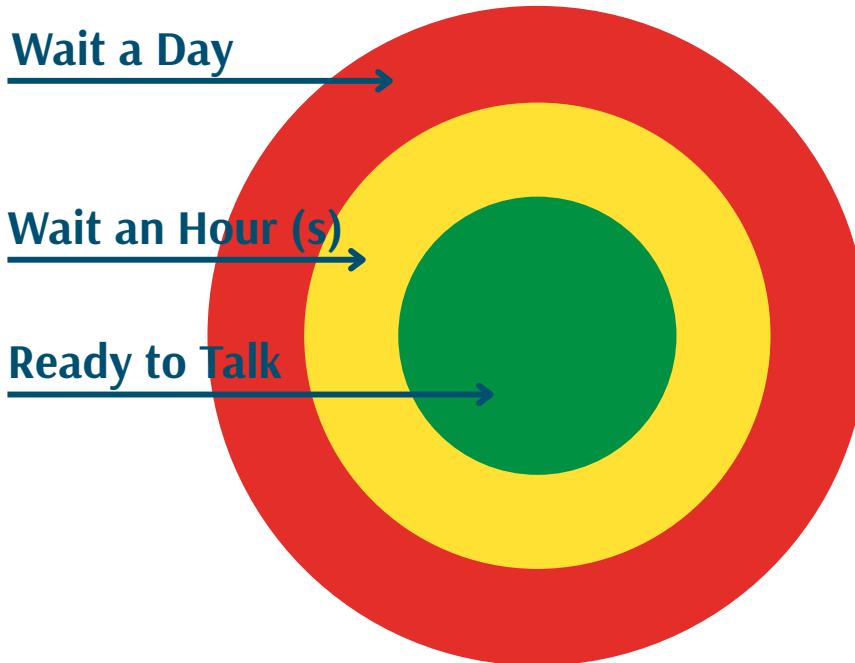
The Applied Educational Neuroscience (AEN) framework encourages us to rethink this approach by replacing the word **consequences** with the word **experiences**. As parents, our natural instinct during conflict is to teach a lesson. Although those life lessons are important, what if we could deliver them in a way that supports regulation, connection, and repair?

Rather than default to punitive consequences, the AEN framework invites us to create experiences that help calm the nervous system and foster co-regulation. It's not about removing accountability but, about understanding the language of the nervous system first. In moments of difficulty, what if we offered time, space, and attunement, helping our children move towards regulation before addressing the problem. Once a child is calm and regulated, their brain can begin to learn, problem-solve, and repair. This shift transforms discipline from something punitive into something relational and restorative. As Dr. Lori states, “Building this trust and respect will guide our children and youth to the prefrontal cortex where logic, reasoning, emotional regulation, and learning can be accessed.” By reshaping discipline through the lens of connection and safety, we can help our families, grow, heal, and thrive together.

**Looking for a helpful visual to tie it all together? Flip to the
next page.**

The Steady Target

A focus point for calm in the chaos



This target (originally created by Jim Sporleder), was developed as a response to what he saw daily in his school: kids in distress were being asked to think logically and articulate their feelings, when their nervous systems were not ready to do so. Jim realized that when students were dysregulated, they couldn't access reasoning or problem-solving skills. So, instead of forcing a conversation, he introduced a simple target and would gently ask, "Point to where you are."

- **Red** meant: I'm overwhelmed. I need a lot of time—maybe a full day—before we talk.
- **Yellow** meant: I'm still upset. Give me an hour or more.
- **Green** meant: I'm calm and ready to talk.

This target became a tool to honor regulation first, and conversation second—a powerful shift away from reactive discipline toward supportive connection. As a parent, you can place this target somewhere visible like your refrigerator, a calm-down corner, or your child's room. It's a quick way to check in during moments of conflict without causing further dysregulation. This tool brings the AEN framework into everyday family life. It's not about letting go of accountability. Those important conversations will still happen. They just happen after the child is calm and can truly process, reflect, and respond.

Using the Steady Target helps children:

- Recognize their internal state
- Feel seen and respected
- Learn to advocate for time and space
- Build trust and safety through co-regulation

It also helps you, slow down, stay grounded, and respond with intention.

Putting AEN into Practice

We all ache to be heard and held in the reality of our experience, without judgment or any impulse toward fixing- Bonnie Badenoch

Through the four pillars, we've explored the powerful connection between the brain, the body, emotions, and relationships. We've discussed how the nervous system shapes behavior, how co-regulation builds emotional safety, and how everyday moments—like a calm breath, a validating word, or shared laughter—can create lasting change. Now, it is time to bring these insights into your daily rituals, not perfectly, but intentionally. By noticing your own nervous system state, slowing down, offering connection in moments of challenge, and choosing presence over perfection, you are already putting AEN into practice. As a parent, you are nurturing a relationship, shaping a nervous system, and in many ways, healing yourself.

AEN offers a foundation—but now it's your turn to explore how it comes to life in your home, in your relationships, and in your own story. Take what resonates. Be curious about what challenges you. Adapt it to your unique rhythms, values, and needs. This isn't a one-size-fits-all formula—it's a living, breathing practice. The journey doesn't end here. Parenting is ever-evolving, just like you. Keep returning to connection. Keep practicing compassion and most of all, trust that every small, intentional choice you make to co-regulate, repair, or simply be present, matters. You are not alone in your journey.

Remember, you are already the parent your child needs.

Interested in Learning More?



Dr. Lori Desautels, has been an Assistant Professor at Butler University since 2016 where she teaches both undergraduate and graduate programs in the College of Education. Lori's passion is engaging her students through the social and relational neurosciences as it applies to education. She does this by integrating the tier one trauma accommodating Applied Educational Neuroscience framework, and its learning principles and practices into her coursework at Butler. The Applied Educational Neuroscience Certification, created by Lori in 2016, is specifically designed to meet the needs of educators, counselors, clinicians and administrators who work beside children and adolescents who have, and are, experiencing adversity and trauma. The certification is now global and has reached hundreds of educators. Lori's articles are published in Edutopia, Brain Bulletin, and Mind Body Spirit international magazine. She was also published in the Brain Research Journal for her work in the fifth-grade classrooms during a course release position with Washington Township Schools. Lori continues her work co-teaching in the K-12 schools integrating her applied research into classroom procedures and transition, preparing the nervous system for learning and felt safety. Her third book, *Connections over Compliance: Rewiring our Perceptions of Discipline*, was released in late 2020, and *Intentional Neuroplasticity: Moving Our Nervous Systems and Educational System Toward Post-Traumatic Growth*, her fourth book, was released in January 2023. Her new book/manual titled *Body and Brain Brilliance: A Manual to cultivate awareness and Practices for our Nervous System* will be published in 2024. Lori's work, presentation videos and latest research can also be found on her website www.revelationsineducation.com. Lori resides in Indianapolis, Indiana with her husband, Michael. She has three grown children, Andrew, Sarah and Regan and four rescue fur babies. Lori has met with well over 200 school districts across the country, in Canada, Costa Rica, Australia, Scotland, England and Dubai equating to more than 150,000 educators with much more work to be done!

Resources

Anda, R. (2022). ACE Interface. Target. <https://www.aceinterface.com/>

Baird, L. (2024, February). What you need to know about co-regulation. Counselling-Directory.org.uk; Counselling Directory. <https://www.counselling-directory.org.uk/articles/what-you-need-to-know-about-co-regulation>

Dad Neuron and Child Neuron Image. Rima Mumbai. BCST with Rima. <https://www.facebook.com/heylotohealth/>

Desautels, L. (2024). *Body and Brain Brilliance*.

Desautels, L. “Resources, Revelations in Education.” [Revelationsineducation.com](http://revelationsineducation.com), revelationsineducation.com/.

Geneimprint. “Ghost in Your Genes.” Vimeo, 20 Dec. 2017, vimeo.com/248146854.

Shanker, S. (2016). *Self-Reg*. Penguin.

Polyvagal Institute. “What Is Polyvagal Theory.” Polyvagal Institute, 2024, www.polyvagalinstitute.org/whatispolyvagaltheory.

Psychology Today. “How the Polyvagal Theory Inspired My Parenting.” Psychology Today, 2024, www.psychologytoday.com/us/blog/nurturing-self-esteem-in-autistic-children/202402/how-the-polyvagal-theory-inspired-my. Accessed 24 Apr. 2025.

Salamon, Maureen. “Co-Regulation: Helping Children and Teens Navigate Big Emotions.” Harvard Health, 3 Apr. 2024, www.health.harvard.edu/blog/co-regulation-helping-children-and-teens-navigate-big-emotions-202404033030.

Siegel, Daniel J, and Tina Payne Bryson. *The Whole-Brain Child: 12 Revolutionary Strategies to Nurture Your Child’s Developing Mind*. New York, Bantam Books, 2011.

“Steady Parents.” Steady Parents, 24 Apr. 2024, www.steadyparents.com/blog/sensing-safety-polyvagal-theory. Accessed 24 Apr. 2025.