

Addressing Regulation before Expectation: The need for understanding and addressing the sensory system.



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Monica Purdy, M.A., CCC-SLP, COM ®

Relevant Financial Relationships:

- Owner of Kids Abilities Indiana.
- Receives honoraria for CE webinars, courses and seminars including this one.
- Author of Mastering Mastication, Nasal Breathing for Increased Quality of Life, Speech and Sensory Processing- Making the Connection, Kaleidoscope Model

Non-relevant Financial Relationships:

Member of: ASHA, IAOM, AAPMD.





Jen Ray, MOT, OTR/L



Relevant Financial Relationships:

- Clinic Lead of Kids Abilities Indiana.
- Receives honoraria for CE webinars, and courses.
- Author of Sensory Processing- Making the Connection,

Non-relevant Financial Relationships:

.None to report

“ Our brain is mapping the world. Often that map is distorted, but it’s a map with constant immediate sensory input.”

E.O. Wilson



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What comes to your mind when you think of “sensory”, “regulation”?

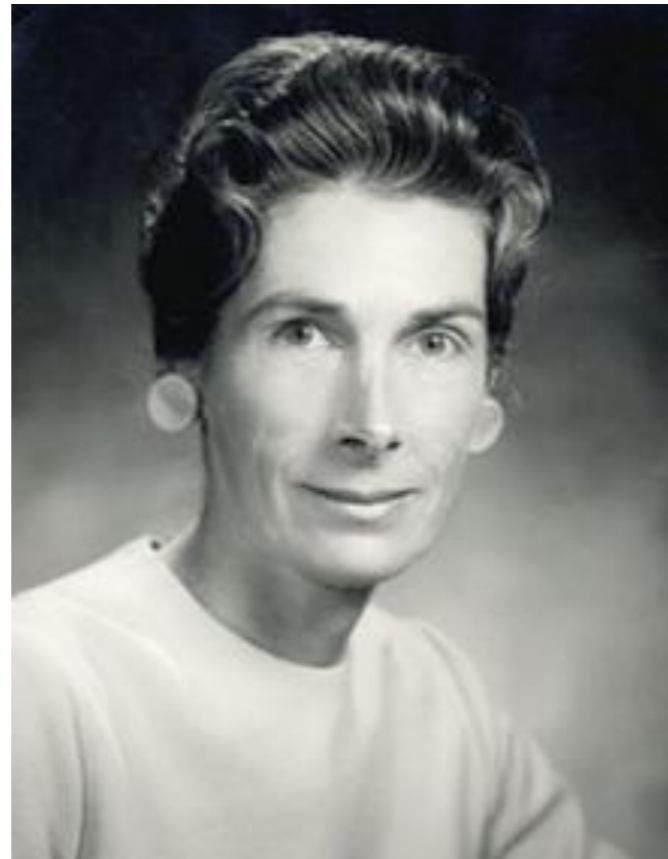
What is your sensory system?

The sensory system (integration) is a
“neurological process that organizes
sensation from one’s own body and from
the environment and makes it possible to
use the body effectively within the
environment.”

Dr. Jean Ayers 1972

REGULATION: Ability to Attend/Focus on
Task
Appropriate Affect
Appropriate Action

History Overview



1923-1989

Dr. Anna Jean Ayres, PhD, OTR, FAOTA, an occupational therapist, psychologist, and neuroscientist as well as an advocate for children with diverse developmental and learning profiles.

In the 1970's Dr. A. Jean Ayres recognized that some individuals process and interpret sensory information differently, which can affect participation, learning, and daily activities.

Founder of:

Ayres Sensory Integration approach

Author of: Sensory Integration and Learning Disorders (1972)

Dr. Lucy Jane Miller, PhD, OTR

- Studied under Dr. A. Jean Ayers
- Founder of the first comprehensive Sensory Processing Disorder research program nationwide (STAR Institute for Sensory Processing) in Denver, Colorado.
- She has worked toward increasing understanding of sensory processing differences and sensory health
- Due to her work, SPD appears in two diagnostic manuals: ICDL's Diagnostic Manual for Infancy and Early Childhood and The Diagnostic Classification: Zero to Three.
- Worked on getting SPD added to the Diagnostic and Statistical Manual (DSM-V) in 2013; although Sensory Processing Disorder itself is not currently a standalone DSM diagnosis.
- Sensory processing differences are now recognized as an important feature of many autistic individuals' experiences as a feature of Autism Spectrum Disorder in DSM-5.
- “Written and published 10 nationally standardized norm-referenced tests that screen for developmental disorders and provide diagnostic assessment of various domains of function. “
- Author of:
 - Sensational Kids: Hope and Help for Children with Sensory Processing Disorder
 - No Longer A SECRET: Unique Common Sense Strategies for Children with Sensory or Motor Challenges.

[Dr. Lucy Jane Miller Announces Retirement \(sensoryhealth.org\)](https://sensoryhealth.org)



Continuing the legacy



- Formed in 2016 under Dr. Lucy Jane Miller
- In 2020 the Star Institute began to focus on health and wellness

“Mission: To promote participation, well-being, and quality of life by developing and promoting best practices for sensory health and wellness through support, education, and research.”



“Vision: Sensory Health and Wellness for the State, the Nation, and the World.”

Mission, Vision, and History (2023). Retrieved from <https://sensoryhealth.org/basic/mission-vision-history>

The Star Institute

Dr. Virginia Spielmann, PhD, OTR/L

- Worked with and studied under Dr. Lucy Jane Miller
- Current Executive Director of STAR Institute for Sensory Processing in Denver Colorado.
- She has worked toward increasing neurodiversity affirming care and trauma informed care.
- “She contributed to the STAR Frame of Reference as part of the 4th Edition of *Frames of Reference for Pediatric Occupational Therapy*, alongside Dr. Miller and Dr. Schoen.”
- Authored and delivered TEDx Mile High talk: “Your Sensory Health Matters: Here’s Why”

Staff (2017, August). Retrieved from <https://sensoryhealth.org/staff/virginia-spielmann-phd-otr-l-she-her>

Continuing
the legacy



Sensory Simply Stated

- The sensory system allows us to receive, interpret, and respond to information from both our bodies and our environments.
- Every person processes sensory information differently. These differences influence how we learn, communicate, participate, regulate emotions, and engage in daily activities.
- When sensory needs are not being met, or when sensory information becomes overwhelming or difficult to interpret, a person may experience challenges with regulation, participation, attention, or comfort.
- Understanding sensory processing through a strengths-based lens helps us create environments and supports that promote success.

Neuroanatomy, Sensory Nerves, (2023, July). Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK539846/#:~:text=The%20sensory%20system%20is%20the,associated%receptors%20rapidly%20relay%20information.>

Eight Sensory Systems

5 Externo Systems



Vision /Sight Function: integrates with other senses, attention, discrimination



Olfactory/Smell Function: Helps with Tastes, Discrimination (Good and Bad), Influences emotional centers in the brain.



Gustatory/Taste Function: Discrimination (Taste, temperature, texture)



Tactile/Feel/Touch Function: Meaning, discrimination, correlates with proprioception, protective and emotional responses.



Auditory/Hearing Function: Attending, discrimination, processes, responding

3 Internal Systems/Subconscious



Proprioception Function: input you get from muscles and joints.

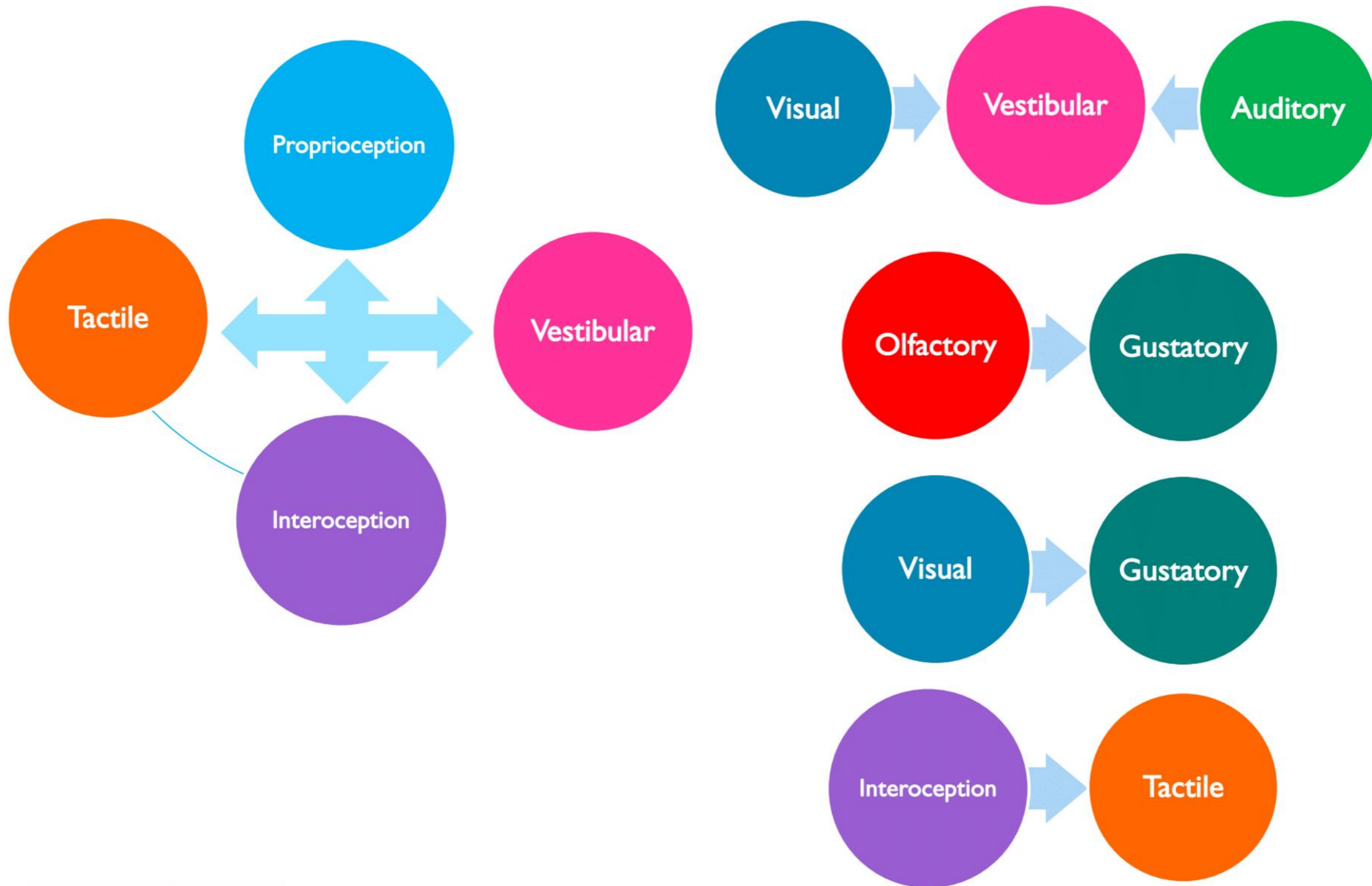


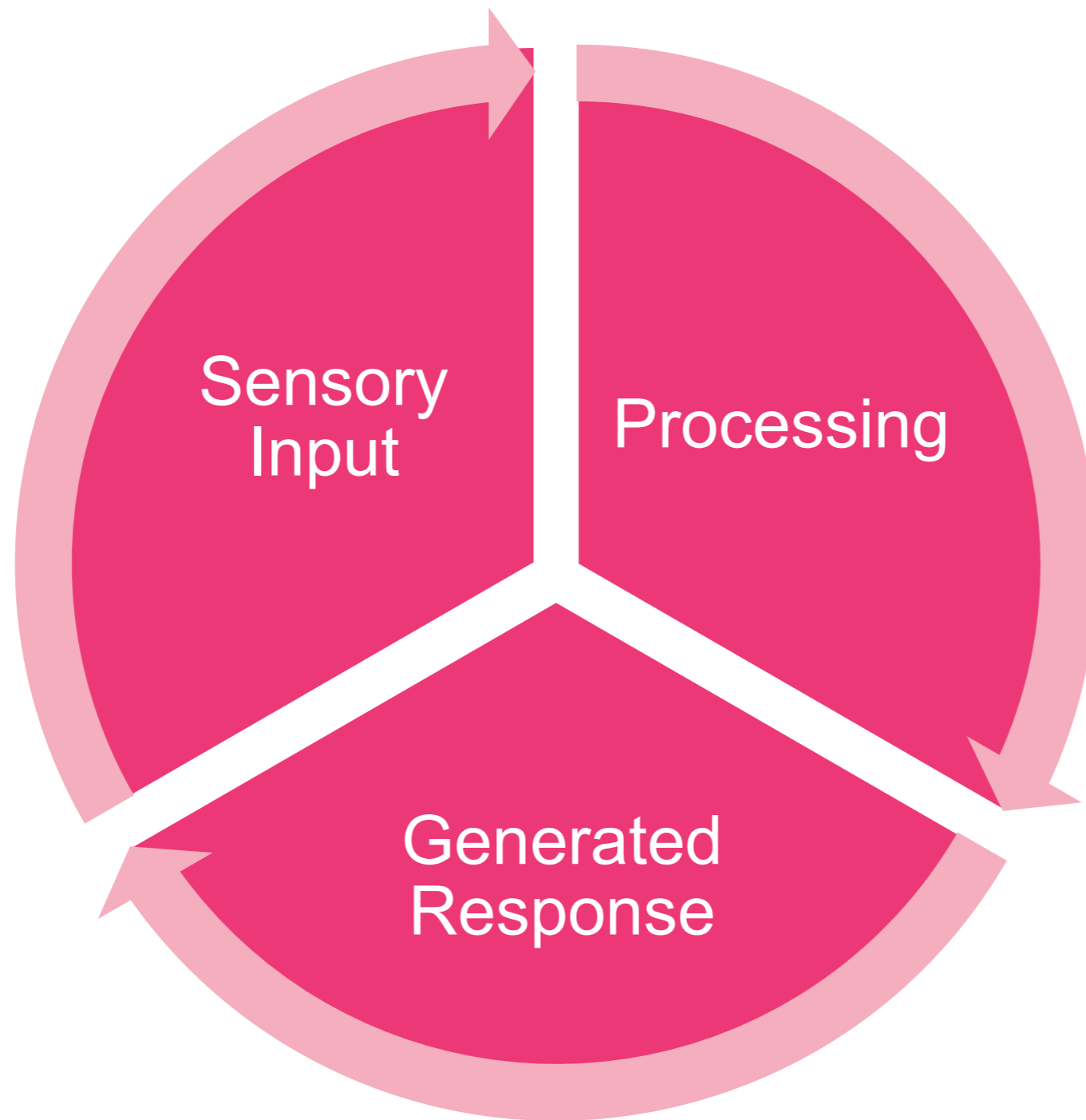
Vestibular Function: Where your body is in space, orientation.



Interoception Function: Input you get from internal organs.

How Systems Interrelate





Sensory System Visual

Source: <https://www.helloasso.com/assonations/association-change-ton-regard>

I put everything in my mouth

I don't want to do anything
I cover my ears or my eyes
I stare at lights and love loud noises

I have difficulty dressing myself.
Difficulty with handwriting

I have poor gross motor skills, such as running and riding a bike



I hate having my hair washed, brushed or cut

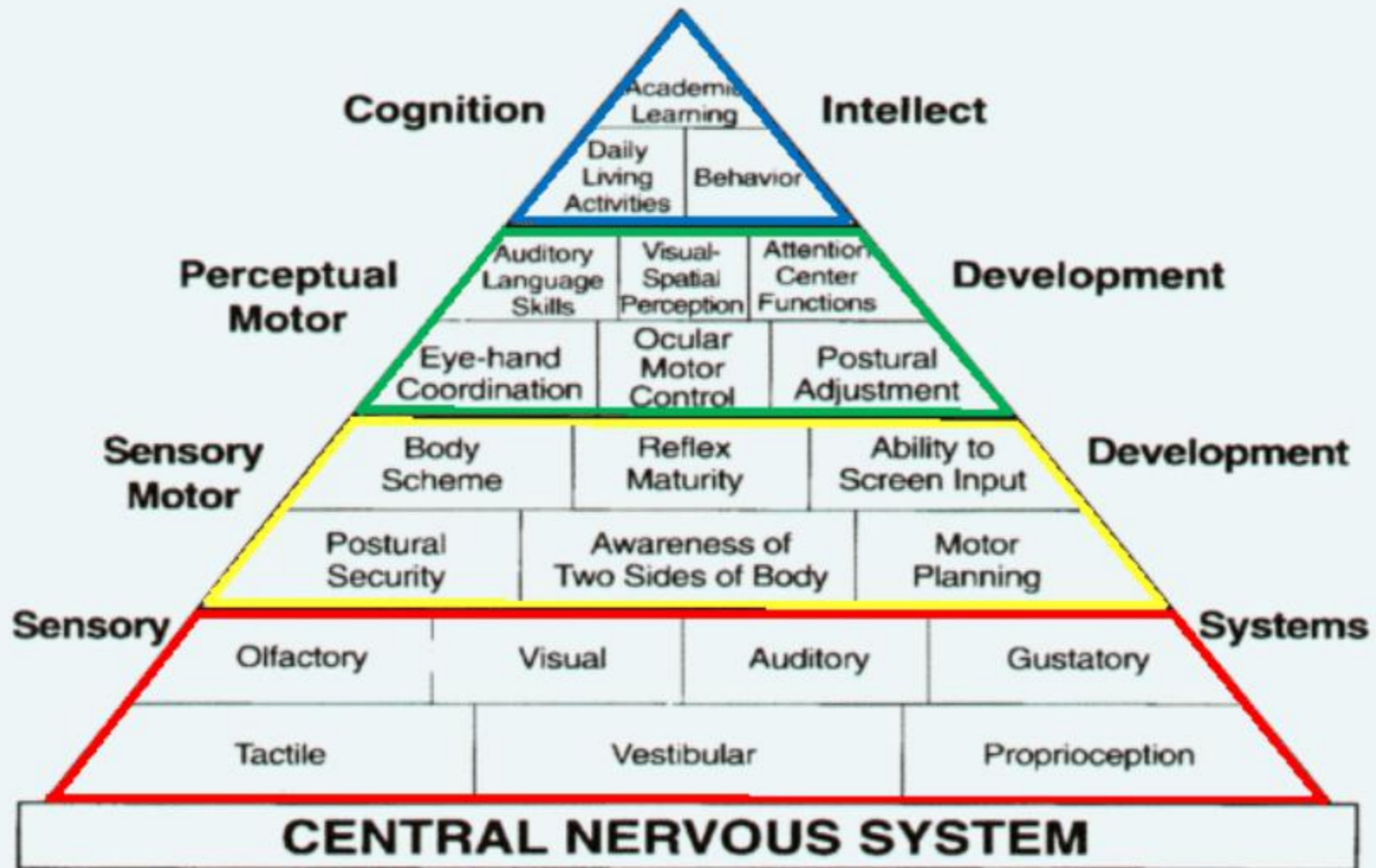
I have difficulty listening or do not respond when my name is called

I am a picky eater," I only like the things I like:

Difficulty with potty training

I don't like wearing shoes

Pyramid of Learning

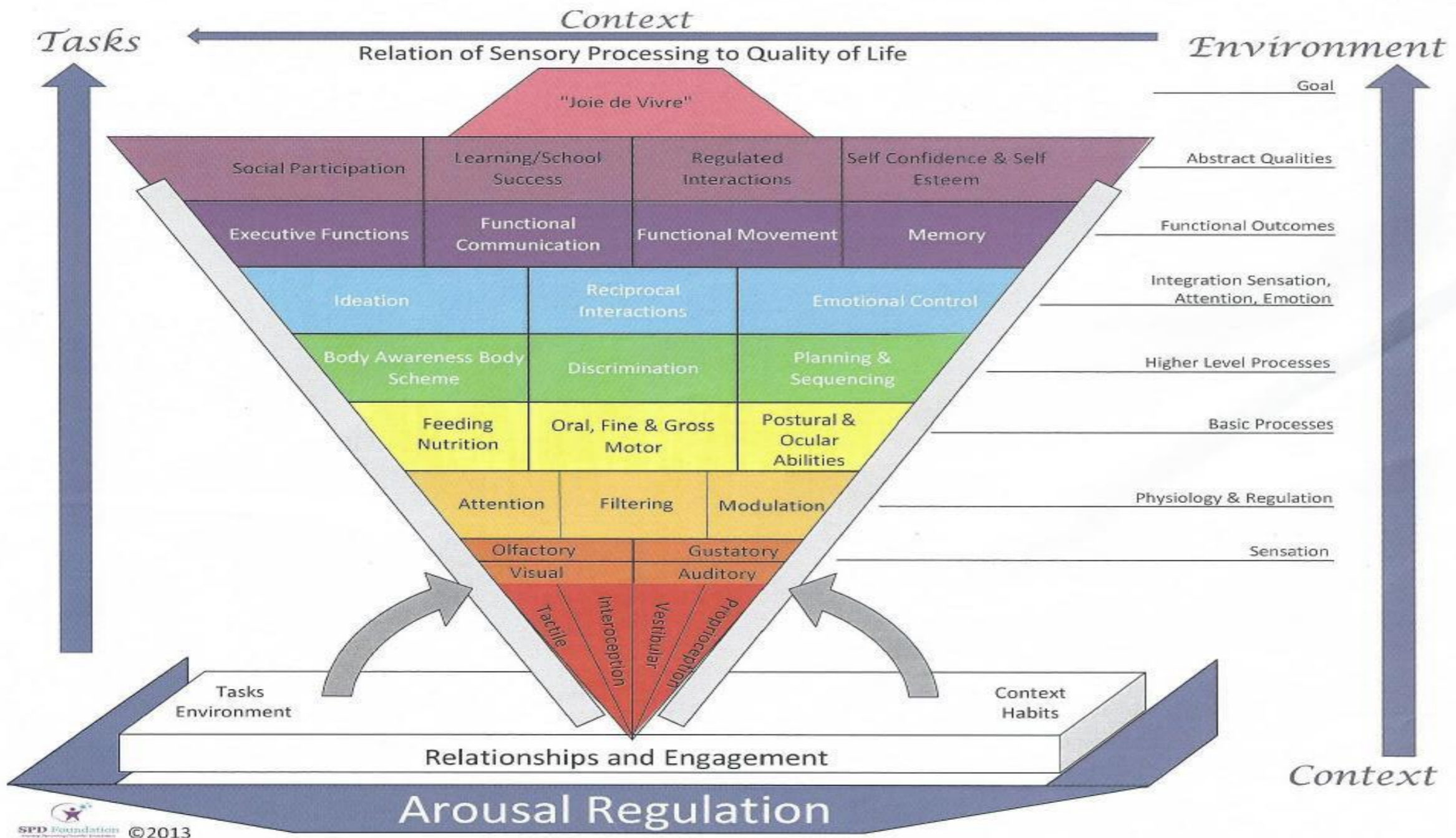


(Edited with color and posted with permission from M. Trott 2/2020)

DevelopLearnGrow.com

The Sensory Pyramid of Learning. <https://developlearngrow.com/the-pyramid-of-learning/>

STAR Pyramid



SPD Foundation ©2013

“Learning problems are **NOT** diseases.
They are “crossed wires” in the
communication network that connects a
child to his/her world.”

Dr. Paul E. Dennison
Co-creator of Brain Gym®

REGULATION:

Ability to **A**ttend/Focus onTask

Appropriate **A**ffect

Appropriate **A**ction



A's

- **Arousal State:** “ state of the nervous system, describing how alert someone feels”

Bundy, A. C., & Lane, S. J. (2020). *Sensory Integration: Theory and Practice* (Third Edition ed., p. 432). : F.A. Davis.

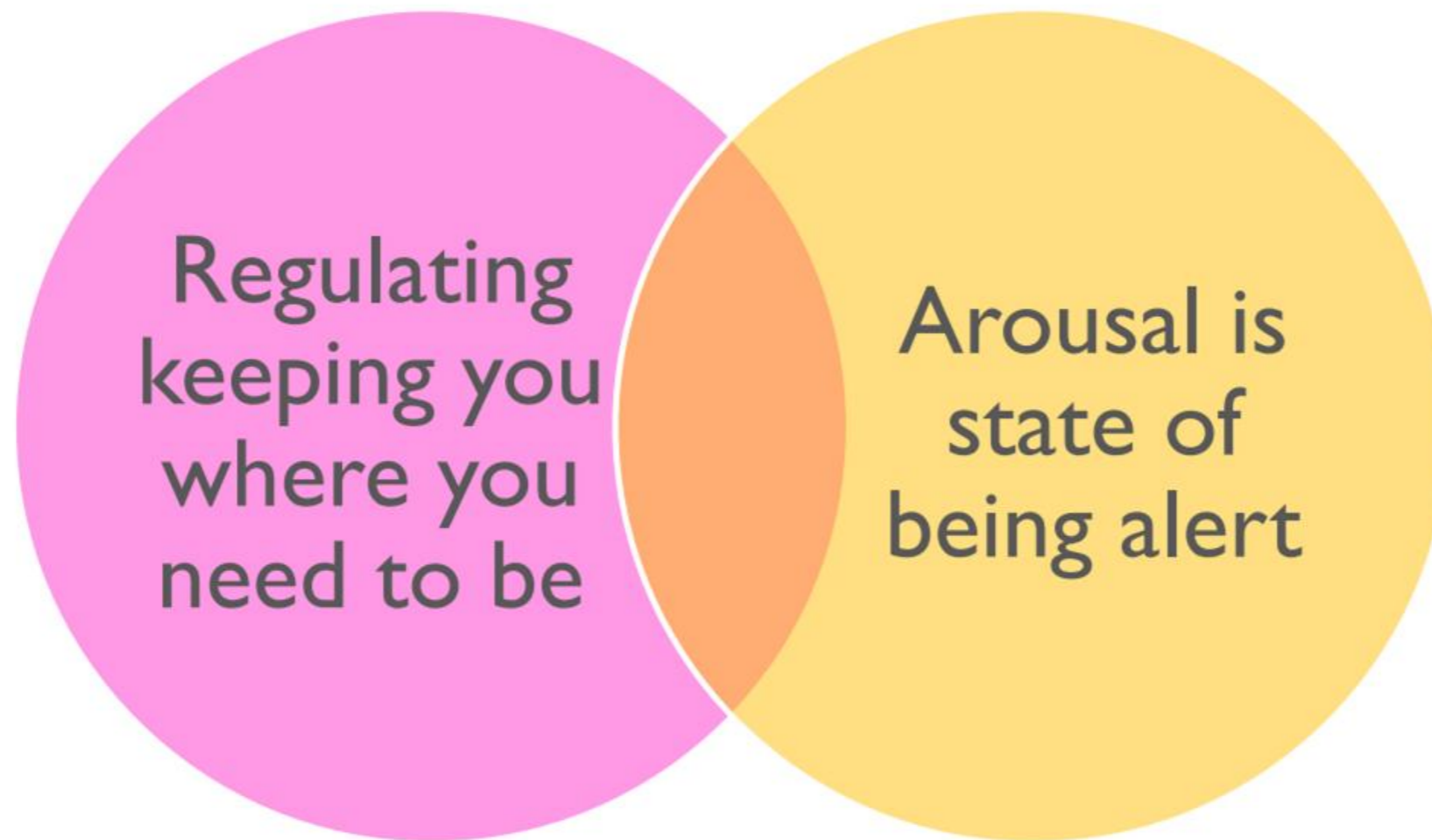
- **Optimal (Moderate) Arousal:** A person is alert, organized, able to engage and adapt to the environment
 - They can perform the task and show an emotional response, such as enjoyment.

Bundy, A. C., & Lane, S. J. (2020). *Sensory Integration: Theory and Practice* (Third Edition ed., p. 163). : F.A. Davis.

- **Over-arousal:**
 - Lead to behavioral disorganization, inability to complete tasks, and negative responses
 - Over-arousal and over-responsive are linked but not the same thing
- **Under-arousal:**
 - Lead to a lack of engagement, disorganization, and inability to complete tasks.
 - If someone is under-responsive, they may appear to be under-aroused

Bundy, A. C., & Lane, S. J. (2020). *Sensory Integration: Theory and Practice* (Third Edition ed., p. 163-165). : F.A. Davis.

Regulation and Arousal



Sensory or Behavior?

My child is aggressive

Sensory

Tornado

Sensory

Very picky

Sensory

Needs to have it his way

Sensory

Can't sit still

Sensory

Controlling

Sensory

Lazy

Sensory

Obsessive

Sensory

Food Stuffs

Sensory

Does not interact with others

Sensory

Behavior is communication. Sensory, emotional, environmental, and communication factors all contribute to how a person responds.

Looking through a curiosity lens



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Looking through a sensory Lens

Providing a sense of safety to learn-

Creating safety, connection, and regulation supports learning. When individuals feel safe and supported, they can better access sensory information, engage with others, participate in meaningful activities, and develop new skills. Regulation supports participation.

Establishing the foundation for the integration of the body and sensory information. Calming the body's nervous system.

Accessing the physical (Where am I), emotional "How do I feel" and mental (coordinating both sides of the body "Who am I", "What is it") aspects of learning

Experiences help us learn and grow,
enabling us to acquire and refine our
new skills.

Start with the foundation =Safety, Connection, and Sensory Support



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Instead of being **reactive**

Be reflective

Be **PROACTIVE**



Spectrum of Learning



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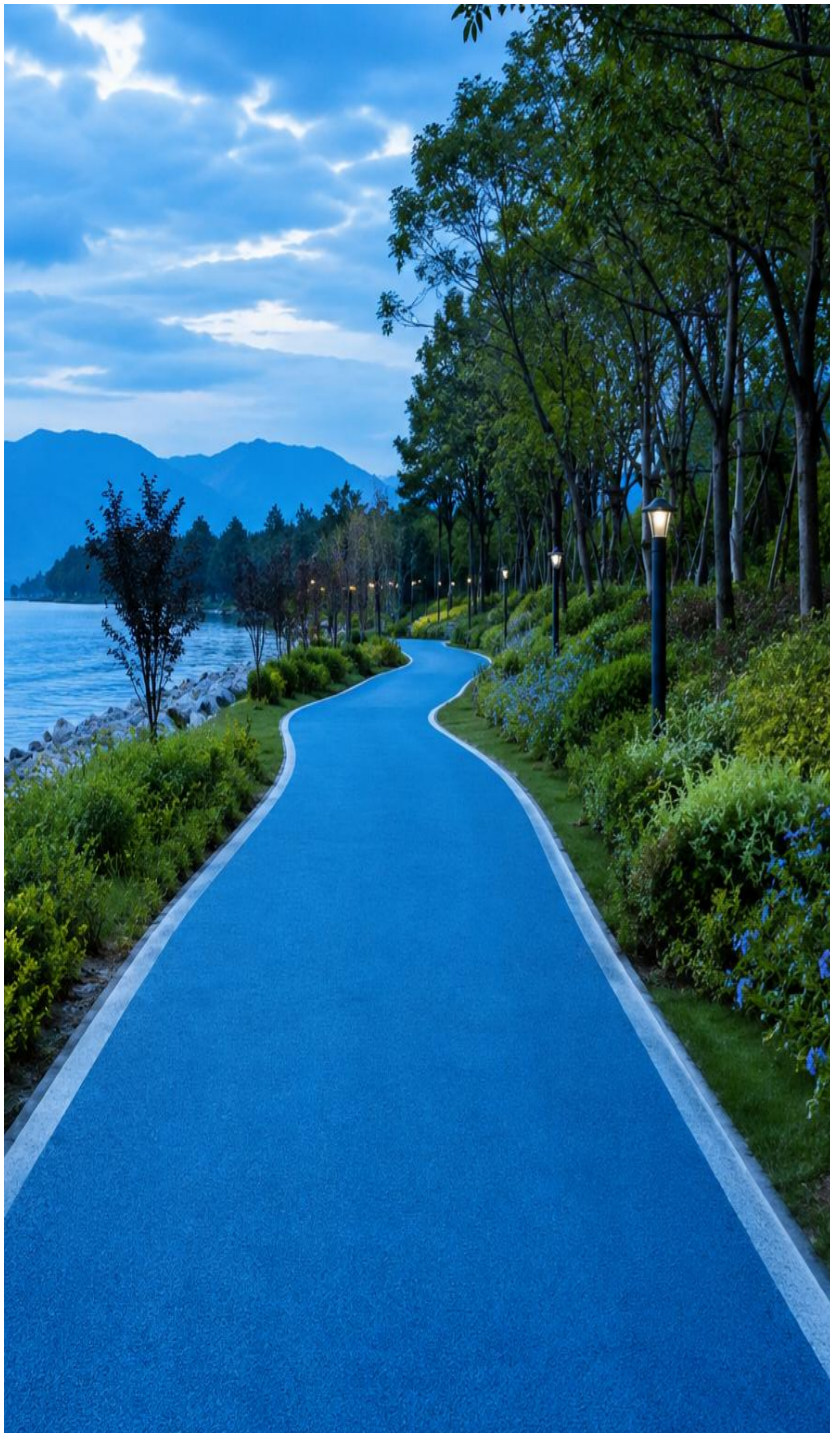
Pathways of the Autonomic Nervous System

Mona DelaHooke describes autonomic states (arousal states) as colors.

- This is to guide adults in how to engage with a child depending on which “pathway” they are on
- These pathways were defined from the Polyvagal method
- Three colors are used: blue, red, and green

Delahooke, M. (2019). *Beyond Behaviors: Using Brain Science and Compassion to Understand and Solve Children's Behavioral Challenges* (pp. 49). : PESI Publishing & Media.

Blue Pathway



- Blue Pathway (dorsal vagal system)
 - this is where we would immobilize and shutdown
 - it is a protective pathway
 - they are responding to cues of “extreme danger”
 - Frequently over-looked due to no obvious behavioral challenges
- This may look like:
 - Appears disinterested in environment/toys
 - Withdrawn-makes few sounds, won't engage
 - Slow moving, slumped posture, may appear tired

Delahooke, M. (2019). *Beyond Behaviors: Using Brain Science and Compassion to Understand and Solve Children's Behavioral Challenges* (pp. 49). : PESI Publishing & Media.

Red Pathway

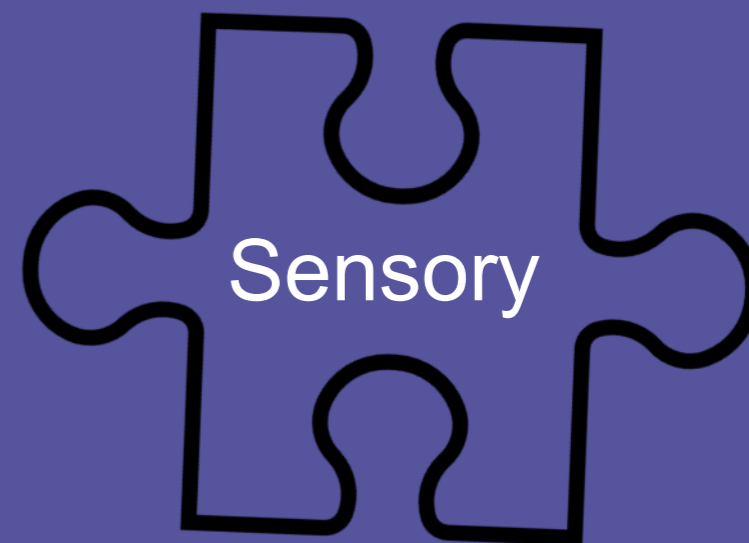
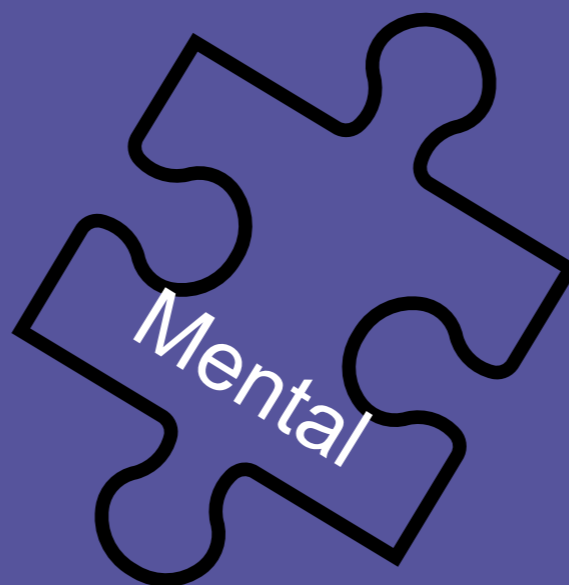
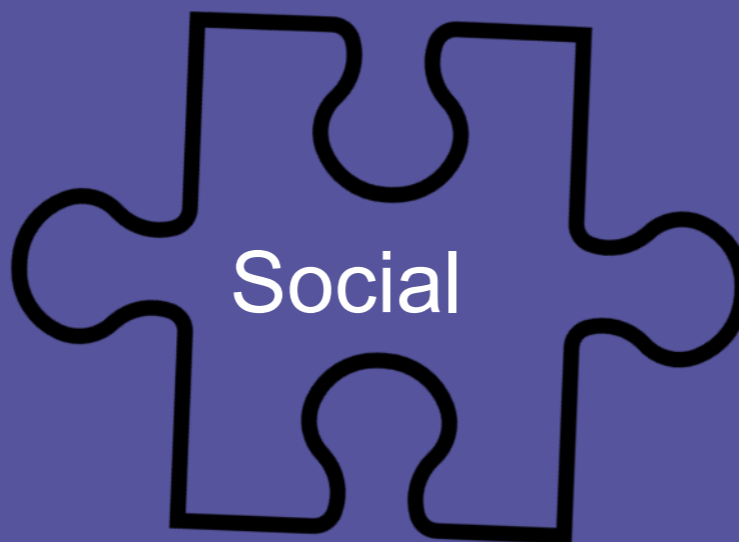
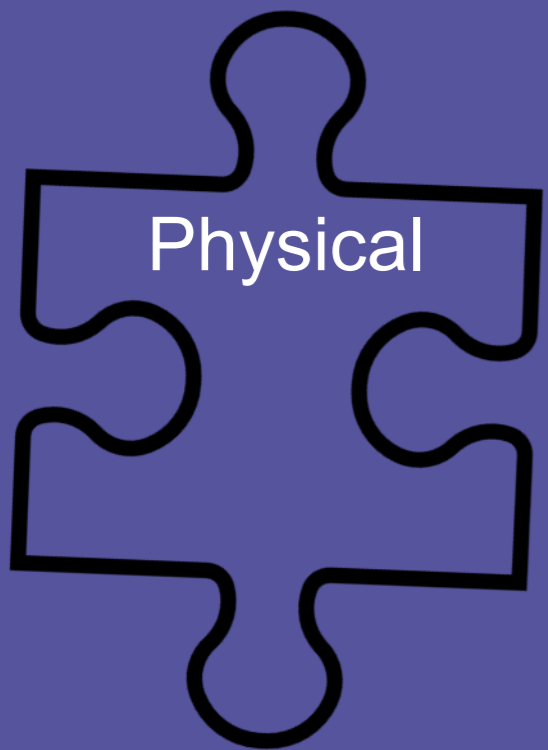
- Red Pathway (sympathetic nervous system)
 - Fight or flight
 - Believes there is a threat
 - Mobilized to escape threat
 - These are the “problem” kids in class
- This may look like:
 - Appear to be seeking some type of input
 - Physically aggressive
 - Could appear angry or being giving a fake forced smile-think of an exaggerated emotional response
 - Fast, impulsive movement
 - Loud-crying, yelling, screaming or laughing

Delahooke, M. (2019). *Beyond Behaviors: Using Brain Science and Compassion to Understand and Solve Children's Behavioral Challenges* (pp. 49). : PESI Publishing & Media.

Green Pathway

- Green Pathway (ventral vagal)
 - It is described as a child can “communicate, play, and learn”
 - Feels safe
 - Engaged and connected with others and environment
- This may look like:
 - Alert and able to visually attend
 - Able to adapt movements to environment
 - Is able to express all emotions at appropriate times
 - Coordinated movements
 - Relaxed in one’s own body
 - Tone changes

Delahooke, M. (2019). *Beyond Behaviors: Using Brain Science and Compassion to Understand and Solve Children's Behavioral Challenges* (pp. 49). : PESI Publishing & Media.



Getting out of Fight, Flight or Freeze



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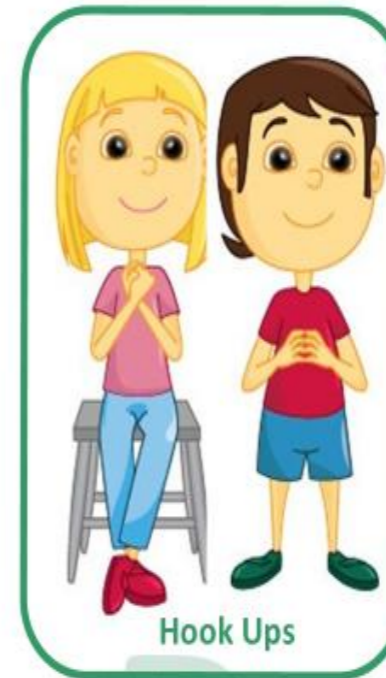
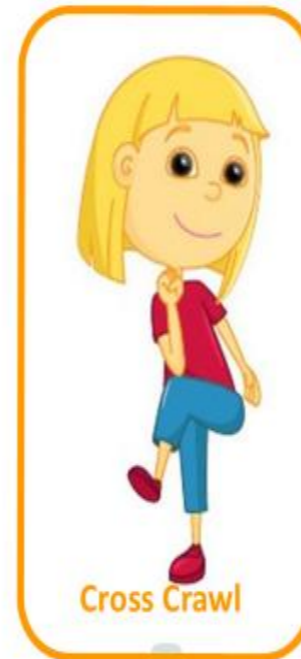
IDEAS to Help with Supporting a Return to Safety and Regulation



Foot and Hand Lengthening: Fundamental Movement Development Technique

Marcovici, L., Dubois, M C., Turgeon, C., and Erickson, C. 2023. The ABCs of Movement and Development: Foundations for Life and Learning. RekineXion Montreal, Quebec..

P. A. C. E.



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From: Brain Gym® 101 Handbook, Balance for Daily Life by Dr. Paul E. Dennison and Gail E. Dennison, published by Edu-Kinesthetics, inc. 2007.

Brain Gym® for Little Ones

Hooking Up
FROM HEAD TO TOE

©2018 RekinēXion

Don't Underestimate Deep Pressure



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Co-Regulation



Co-regulation happens when a regulated adult helps support another person's nervous system through connection, safety, and shared regulation.

What are activities that regulate or dysregulate you?

Understanding dysregulation: How to Support a Highly Emotional Child



Dysregulation occurs when the brain responds to sensory input in a manner that triggers the alarm state.



When a child is dysregulated, it is harder to listen, comprehend, and cope.

Remember the Three "R"s

Regulate

focus on soothing your child. Make them feel calm, safe, and loved.



Relate

Validate their feelings with your words and tone of voice. "I know you're upset right now." "This is very hard". Focus on connecting with your child.

Reason

Once your child is calm, now it is time to talk about alternatives to behaviors while reinforcing limits you set before. You can reassure them you love them but that the behavior they're exhibiting is not ok.



Until a child is regulated, they are unlikely to be related to you (feel connected & comfortable). And until a child is related, they are unlikely to have the mental capacity to reason with you.

Giving experiences through movement is essential to development.

“Movement is the joy of learning; it helps us to comprehend and to anchor the new experience.”

Marcovici, L., Dubois, M C., Turgeon, C., and Erickson, C. 2023. The ABCs of Movement and Development: Foundations for Life and Learning. RekineXion Montreal, Quebec..

Early Identification

- **Early identification is crucial; it can “minimize the impact of the sensory difficulties on attachment, emotion regulation, and, later, engagement in play, self-care, sleep, and school participation”.**

Bundy, A. C., and Lane, S. J., *Sensory Integration Theory and Practice*. 3rd edition. 2020. F.A. Davis Company, Philadelphia, PA.

Supporting Sensory Needs

- If sensory processing differences are impacting participation in daily life, referral to an occupational therapist with sensory integration training may be beneficial.
- Every individual is **unique**.
- Effective support begins with observation, curiosity, collaboration, and understanding how a person responds to different sensory experiences.
- **The goal** is not to change who someone is, but to identify supports that help them participate successfully in meaningful activities.

“Methods for regulating arousal must be individualized and require an understanding of what dysregulates or regulates a particular child.”

Bundy, A. C., & Lane, S. J. (2020). *Sensory Integration: Theory and Practice* (Third Edition ed., p. 580). : F.A. Davis, Philadelphia, PA..

Treatment

Seeking a qualified Occupational Therapist

Looking for an occupational therapist trained in
SI or Sensory Integration

Understanding of the eight different senses

Considers sensory, emotional, environmental,
and communication factors when understanding
behavior

More than swings and riding a horse

Ongoing view throughout the therapy session

Activities given at home to help
parents/caregivers integrate skills

Regressions – Fluctuations in Regulation

Regulation is not linear. All individuals experience periods where regulation is more challenging.

- There are multiple reasons these can occur
- Always consider their environmental and contextual factors
- Don't be afraid to ask questions
 - This will help you have the full picture and will help guide activities
- Factors that may influence regulation include:
 - Illness
 - Change in home or school environment
 - Change in caregivers
 - Weather
 - Sleep



Meaningful movement experiences can support regulation, body awareness, participation, and learning, whether it is passive or active

Regulation before expectation.
Connection before correction.
Curiosity before judgment.

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