Nature Based OT for Mental Wellness:

Research and Neurological Foundations

Meet Lorelei

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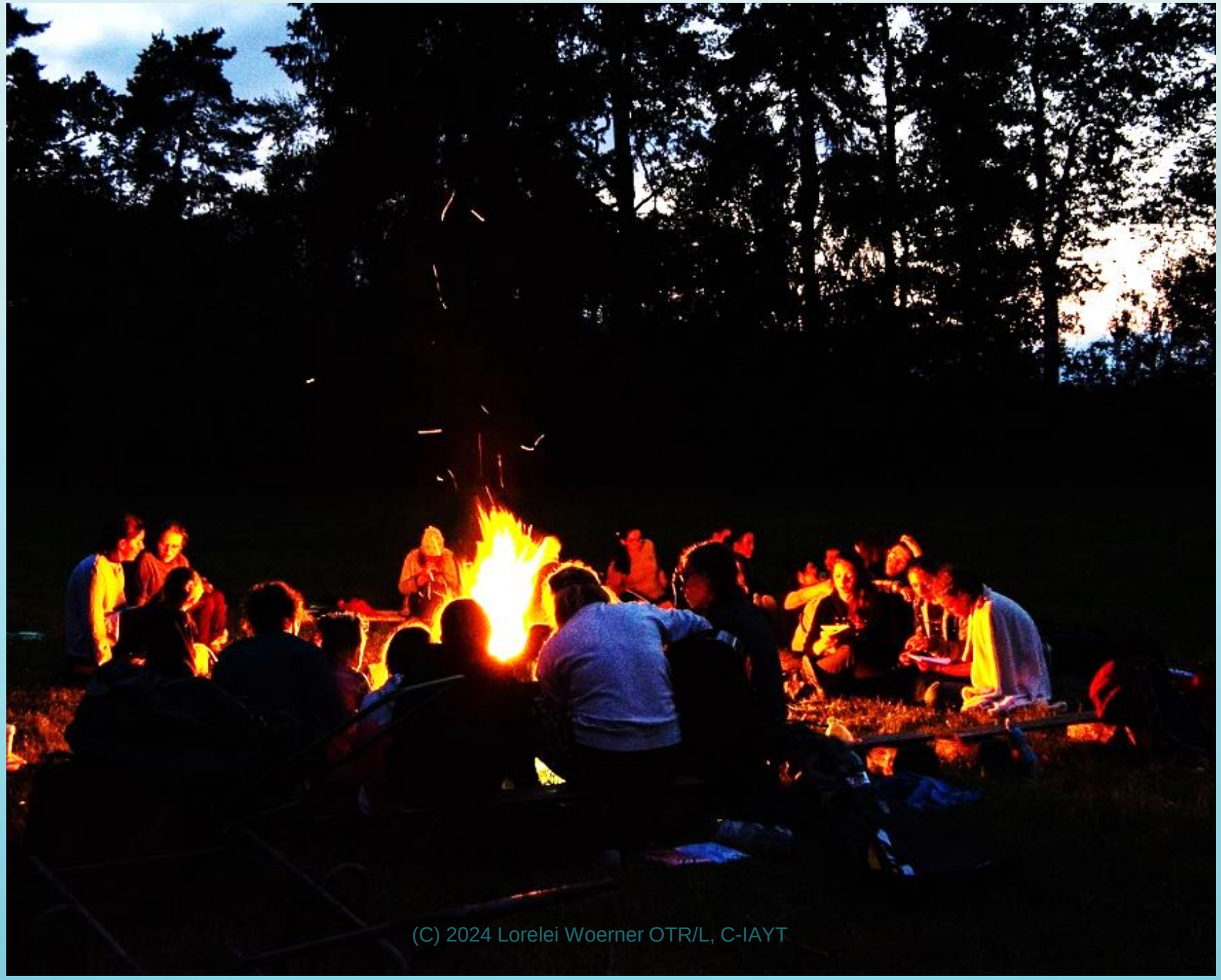
Now It’s Your Turn!

- Introduce yourself
- Favorite tree and why
- Optional physical representation of the tree



“The Biophilia *Hypothesis*”

Greek
Bio = life
Philia = friendly toward

- Term introduced by Edward O. Wilson in his book,

  The Biophilia Hypothesis” (1984)

- According to Wilson, “Biophilia” is the innate human tendency to connect with other living things and nature; that it is rooted in our biology.
- The theory purports that contact with nature is essential for the human psyche and physical well being

AND …***Research*** proving that

physical and mental health and wellbeing is highly influenced by nature

Nature as a Healer is an Ancient Perspective

- From ancient healers to western writers such as Henry David Thoreau, the belief that connecting with the natural world improves wellbeing repeatedly appears throughout recorded human history
  (Selhub & Logan, 2012)
- Aristotle's ethics laid the groundwork for the concept of "biolphilia": the idea that humans have a natural love for life and living things
- "We need the tonic of wildness...At the same time that we are earnest to explore and learn all things, we require that all things be mysterious and unexplorable, that land and sea be indefinitely wild, unsurveyed and by us because unfathomable. We can never have enough of natunfathomed ure."

  (*"Walden: Or, Life in the Woods" by Henry David Thoreau)*

Are we made of natural elements?

Traditional Chinese Medicine

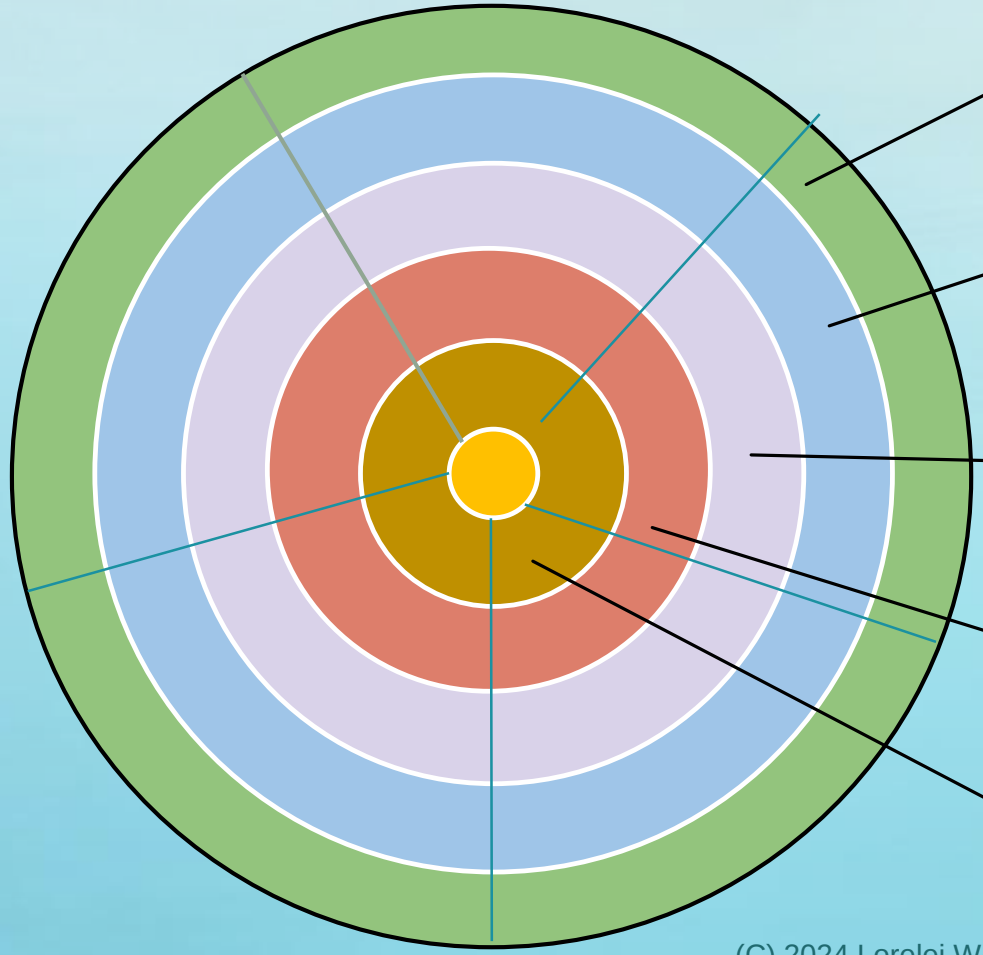
- 3000 years old
- Originated from Chinese philosophy and religion, and rooted in the ancient philosophy of Taoism
- 5 Elements
  - Wood
  - Fire
  - Earth
  - Metal
  - Water

Ayurveda

- 5000 year old
- Ayurveda comes from the Sanskrit words ayur (life) and veda (science or knowledge, and based on ancient Hindu and Samkhya philosophies
- 5 Elements
  - Space
  - Air
  - Fire
  - Water
  - Earth

A Holistic View of Mental Wellness

Layers of the Human System



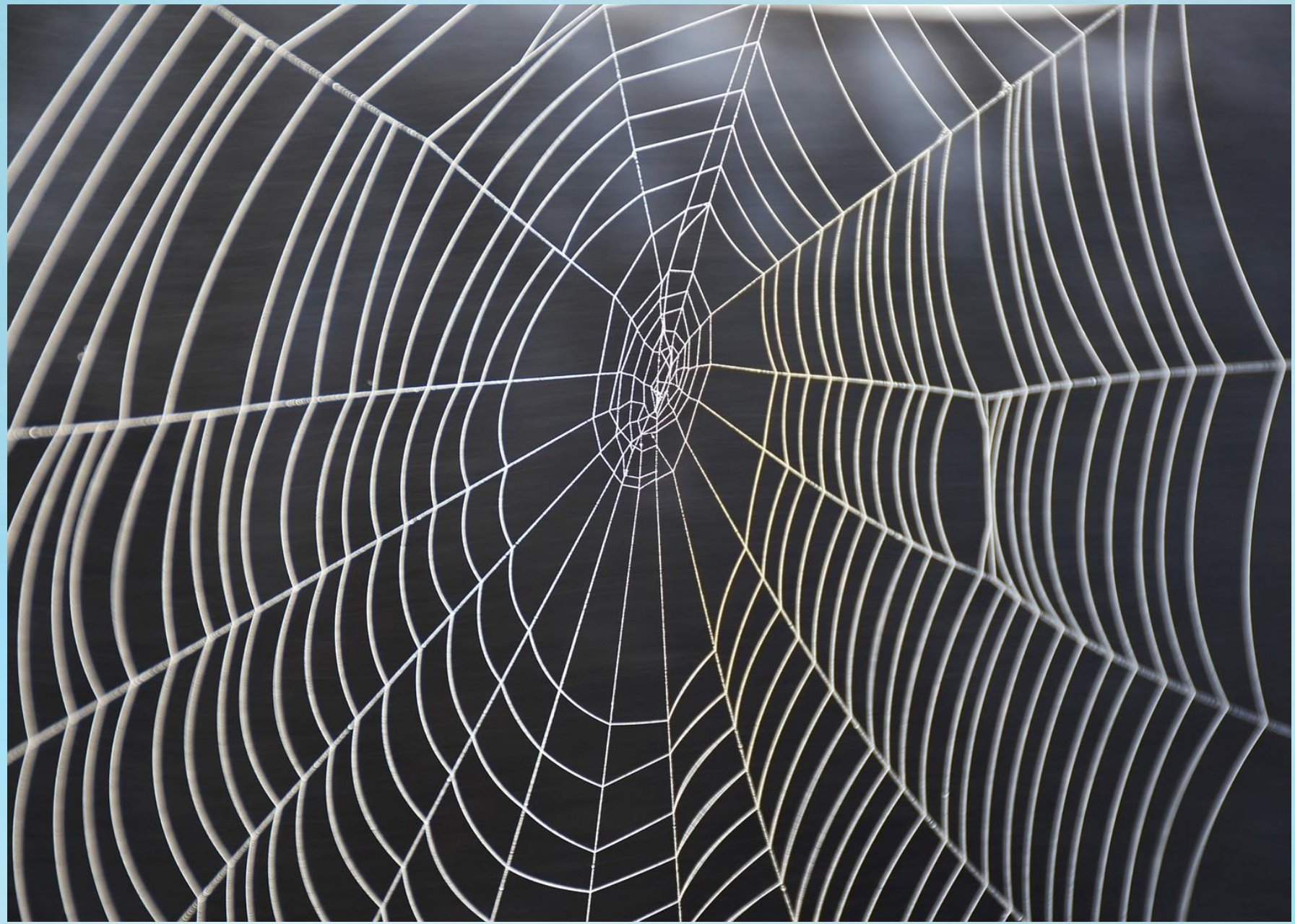
Physical

Physiological/Breath

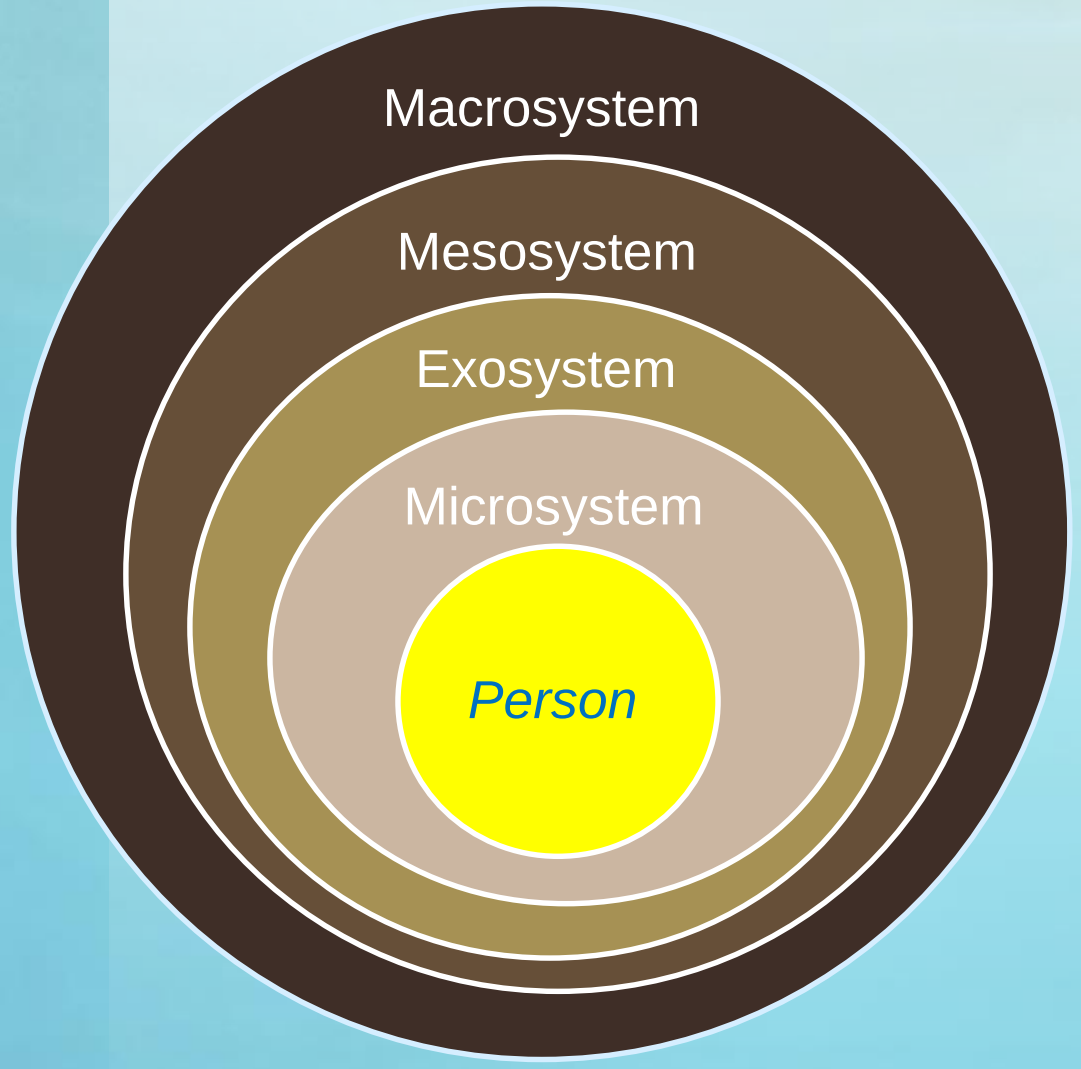
Mind and Cognition

Values and Needs

Emotions



Ecological Perspective of Human Development



Individual – knowledge, attitude, skills

Micro/Interpersonal – families, friends, work, classroom

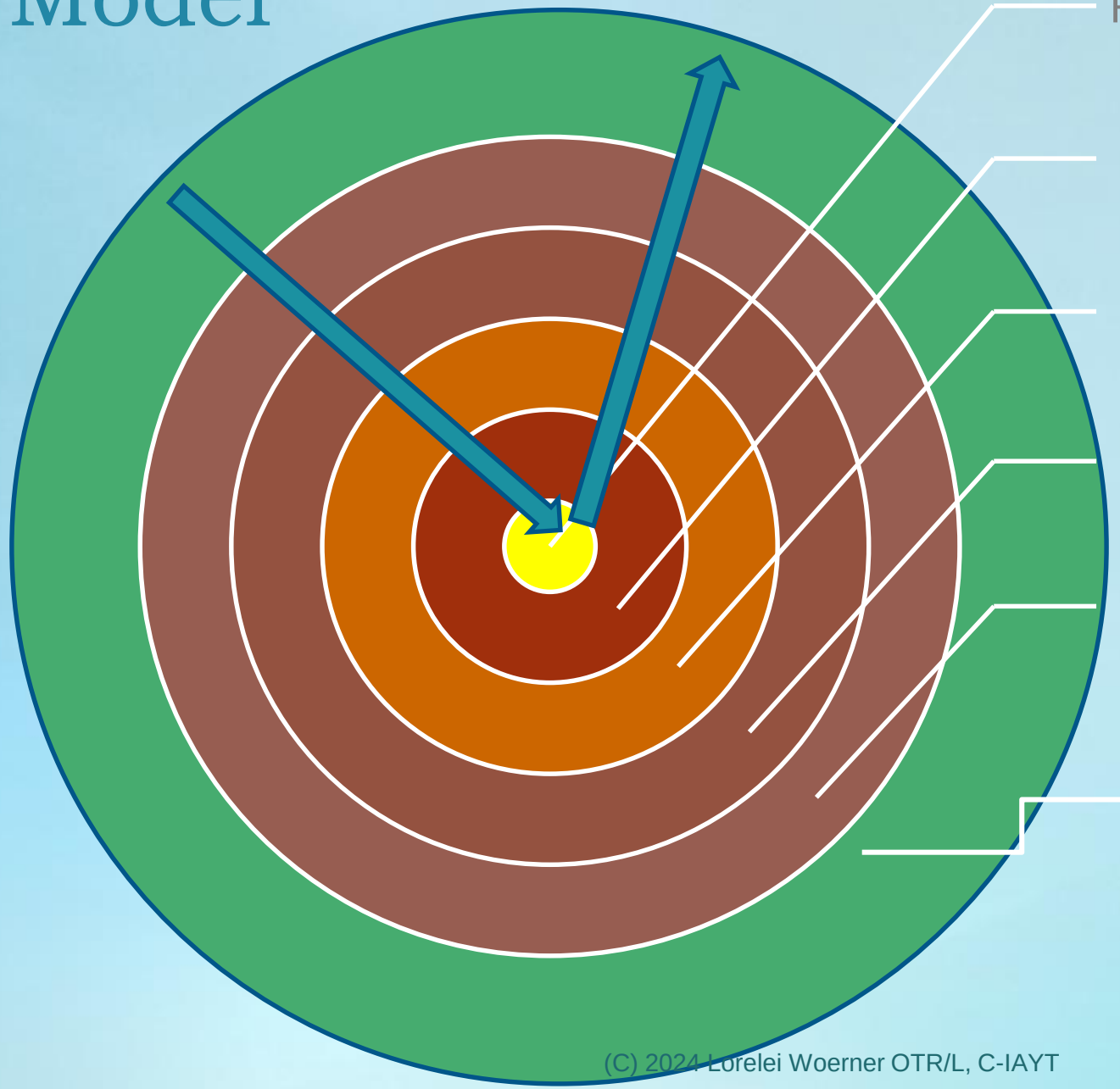
Exo/Organizational – social institutions, organizations

Meso/Community – relationships between organizations

Macro/Societal – national and local policies, culture, norms

*Accounts for the influences of social, **physical**, and political environments. The underlying principle is that if we can change the person's environment, we can change their behavior.*

IWT Model



Human System of 5 Layers

Family, Friends

Educators, Mentors, Therapists

Local Community

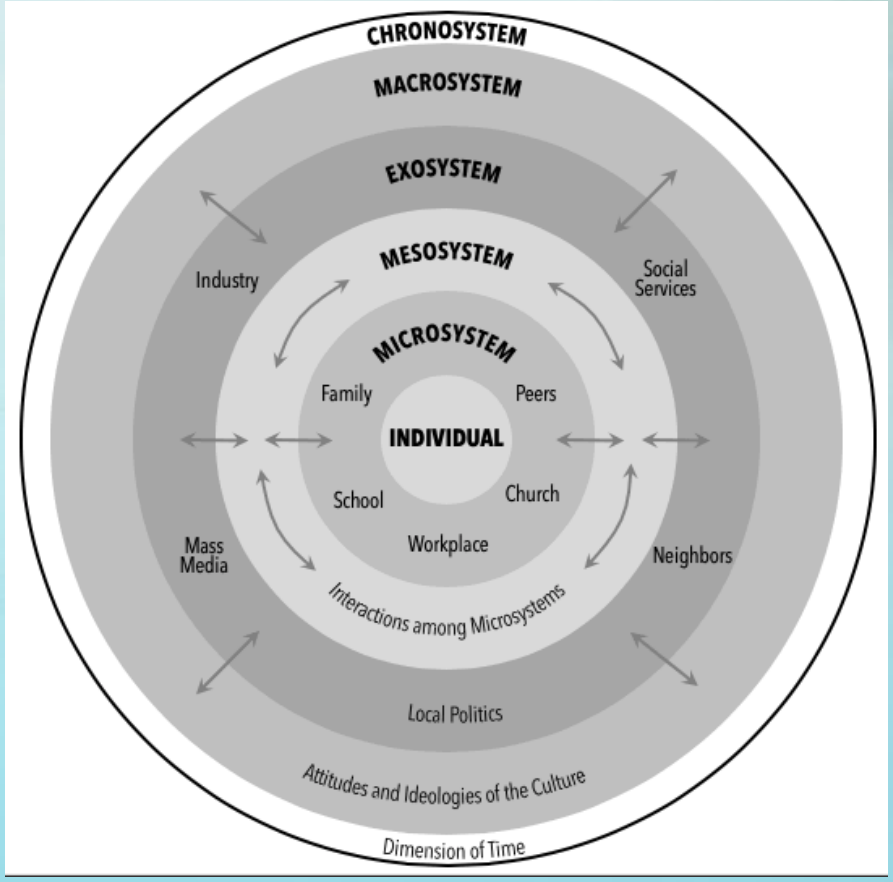
Societal Policies, Norms

Physical Environment

What is Nature-Based OT?

Ecological Counseling

- An approach that considers the interaction between a person and their environment to understand human issues. It's based on the idea that people's behavior is a result of how they interpret their environment, and that problems are systemic and interdependent



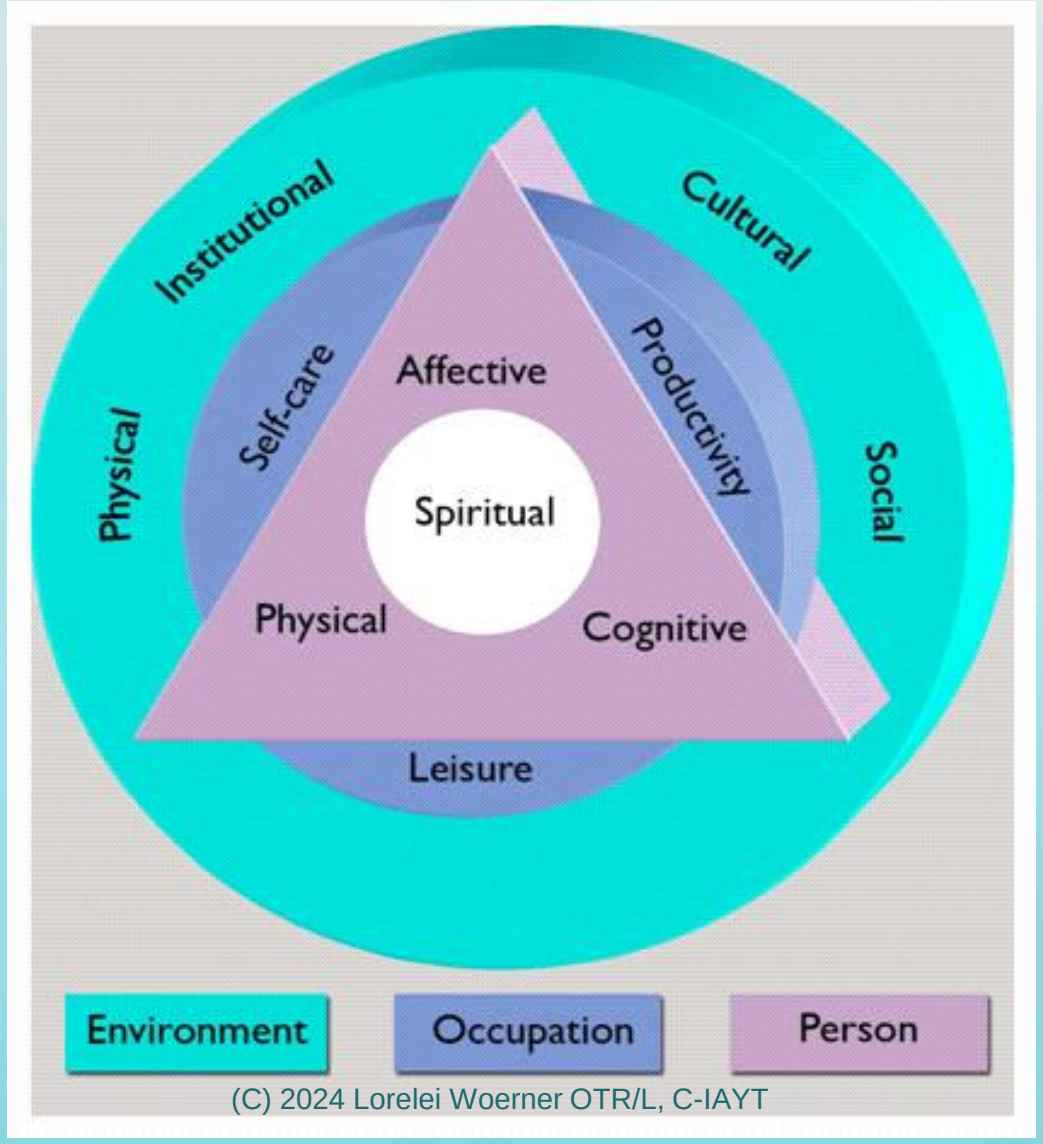
Some types of Nature-Based Therapies

- **Eco-psychotherapy** is a type of psychotherapy that incorporates nature into the therapeutic relationship to promote healing.
- **Ecotherapy**, also known as nature therapy, a type of outdoor therapy that involves spending time in nature to improve mental health.
  - Both eco-psychotherapy and ecotherapy are based on the idea that humans are part of ecosystems and that reconnecting with nature can help with physical and mental health.
- **Nature-Based Rehabilitation** -- a multidisciplinary approach to rehabilitation that uses nature and gardens to promote well-being and reduce stress (gardening, walks, mindfulness)
  - Not standardized, and its definition can vary depending on the context and the organization or governing body that establishes it.

Challenges in using/researching

- Researchers in this area generally use pleasant nature as stimuli and neglect some of the more unpleasant aspects that may not be beneficial to human wellbeing (e.g., mosquitoes or forest fires)
- cautious with making broad conclusions about nature when testing only a few aspects of it
- without widely accepted or explicitly stated definitions of nature itself.
- Individual
- untamed wilderness may generate anxiety
- preference and sensitivities, phobias
- Intensity of some aspects (wave, strong waterfall, heights..)

Canadian OT Model



What is Nature-Based OT?

- Various definitions and expressions due to gaps in the literature:
  - lack of a clear concept of nature-based practices for occupational therapy
  - lack of articulation of the unique contribution of OT to nature-based practices
- **Our Foundational Tenents:**
  - Occupational therapy intervention uses everyday life activities (occupations) to promote physical and mental health and well-being.
  - Enhancing ability to participate in important life activities life, what people need and want to do.
  - Adapting the environment or task to fit individual needs.
  - Science-driven, evidence-based profession
  - Considers the integration of the whole person (bo-psycho-social-emotional-spiritual)

➢Using the natural environment to develop mental, physical and social wellbeing and abilities

➢Connecting occupation and engagement to nature

ECO-Therapy Model

(Dr. Laura Park Figueroa, PhD – 2023 dissertation)
Pediatric Occupational Therapist

- **Ecology of Change in Outdoor Therapy (ECO-Therapy) Model,** is a preliminary interpretive explanation of the causal conditions, contextual elements, and relationships in the nature-based pediatric occupational therapy process.
  - proposes the core mechanism of change involves practitioners and children "braving real-life challenges outdoors together as an impetus for growing adaptive capacity, leading to improved occupational participation and performance in daily life".
  - The model suggests six repeating phases: *Longing for Freedom, Embarking on Adventure, Dancing with Nature, Claiming Self-Agency, Braving Real-Life Challenges, and Growing Adaptive Capacity.*
  - ConTiGO Approach (**Con**nection & **T**ransformation **i**n the **G**reat **O**utdoors)

Nature for: Health Promotion, Remediation of Skills, or Prevention of Disability

Occupations

- Physical challenges and functional mobility
- ADLs (pre, during and post nature activities)
- Creative play and imagination
- *Intrinsic* Motivation and Purpose
- Social interaction and cooperation
- Learning about our natural world
- *Experiencing* properties of physics
- Environmental Stewardship
- Improved Sleep

Performance Skills

- Attention
- Emotional Regulation
- Sensory Processing
- Muscle strength and Endurance
- Cardiovascular Health
- Motor Skills
- Executive Function (planning, problem solving, organizing, initiating and finishing activities)
- Social Interaction

Salutogenesis Perspective

PATHOGENESIS

- Reactive
- What causes disease?
- About avoiding problems
- Health = Absence of disease

SALUTOGENESIS

- Proactive
- What leads to health promotion?
- About reaching potential
- Health = dynamic process of interaction between people and context

Salutogenesis Perspective

- We propose that nature might also have buffering or ‘instorative’ effects. (Beute et al, 2014)
- Nature has been suggested to replenish depleted resources, because of its inherent ability to capture attention without effort (Kaplan, 1995)

Benefits of Nature-Based Therapy

What is “Nature”?

- Nature’ is a complex and multi-layered phenomenon.
- Phenomena of the physical world, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations.
- “Environments and physical features of non-human origin, ranging from landscapes to single species of plants or animals” (Capaldi et al, 2015)
  - **“Nature Connectedness”** is the degree to which people feel connected to the natural world. It's a psychological construct that measures the relationship between people and nature, and is associated with a number of positive outcomes

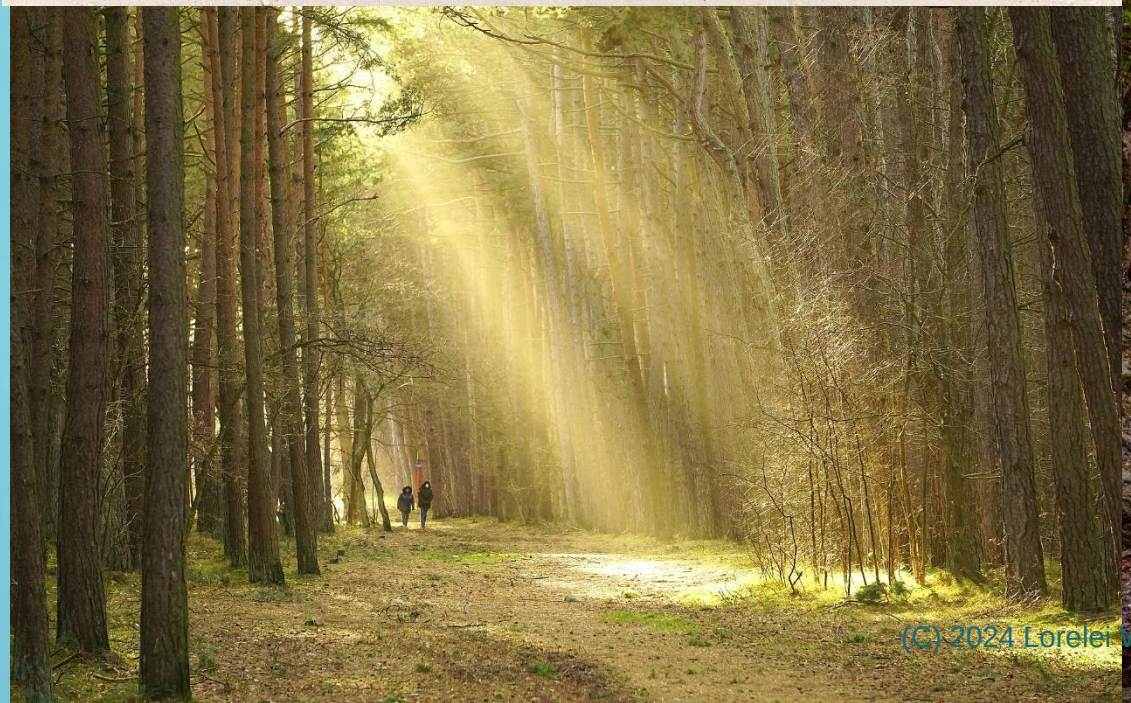
Innate, inherent or essential qualities, features or character of a person or animal

What is “Nature”?

- Natural Physical Environment
  - Forests, Mountains
  - Trees, brush, flowers
  - Gardens, Parks
  - Animals, insects
  - Sky, clouds, sun, stars
  - Clean and fresh air
  - Bodies of water: Oceans, lakes, rivers, waterfalls, ponds, streams

How does nature affect us? (according to research)

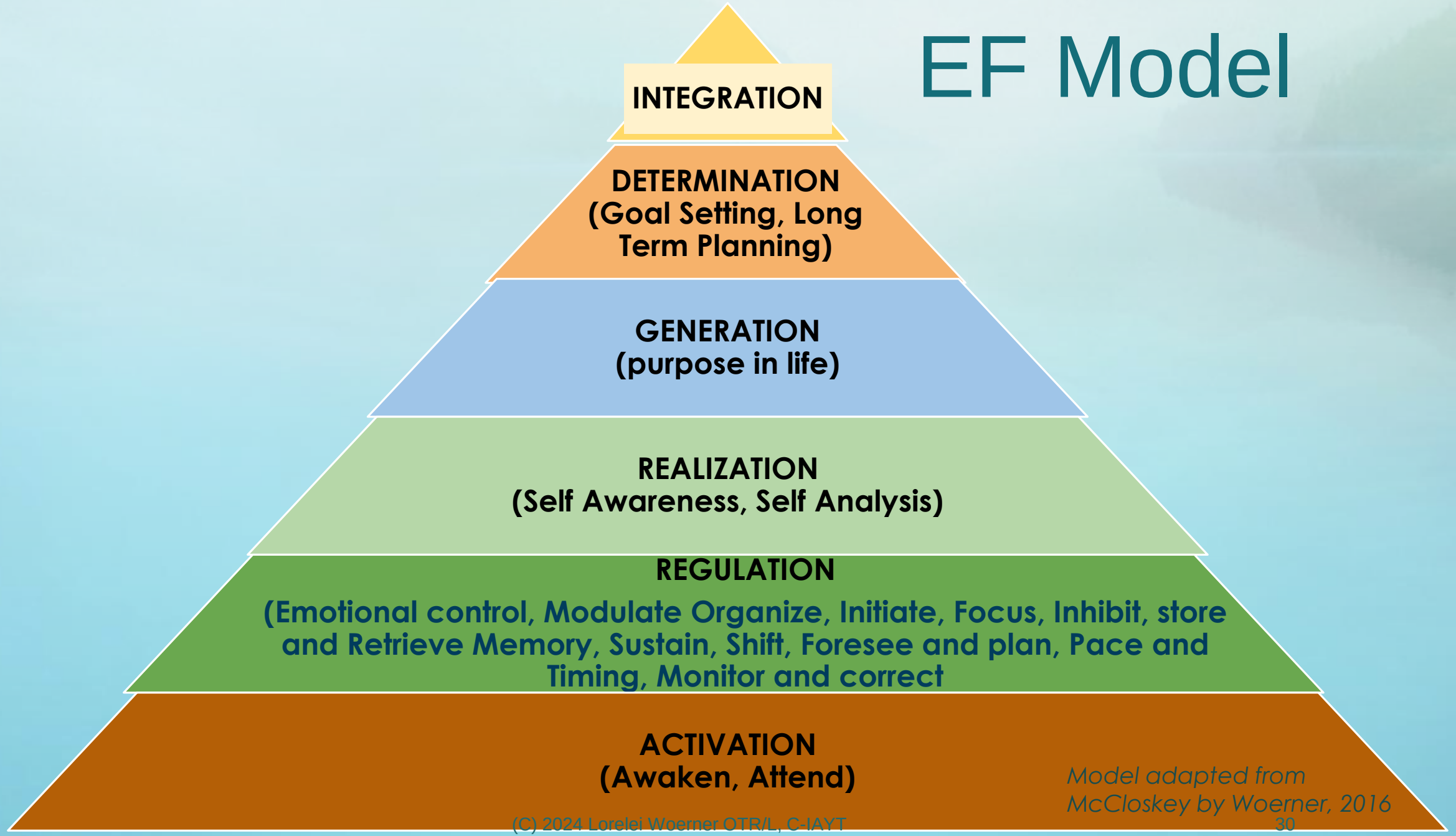
- Improves Self-Regulation
- Increases Attending behaviors
- Supports Cognitive Function
- Promotes Social Engagement
- Enhances Emotional Well-Being
- Boosts Efficacy and Confidence
- Supports Resilience



Self Regulation

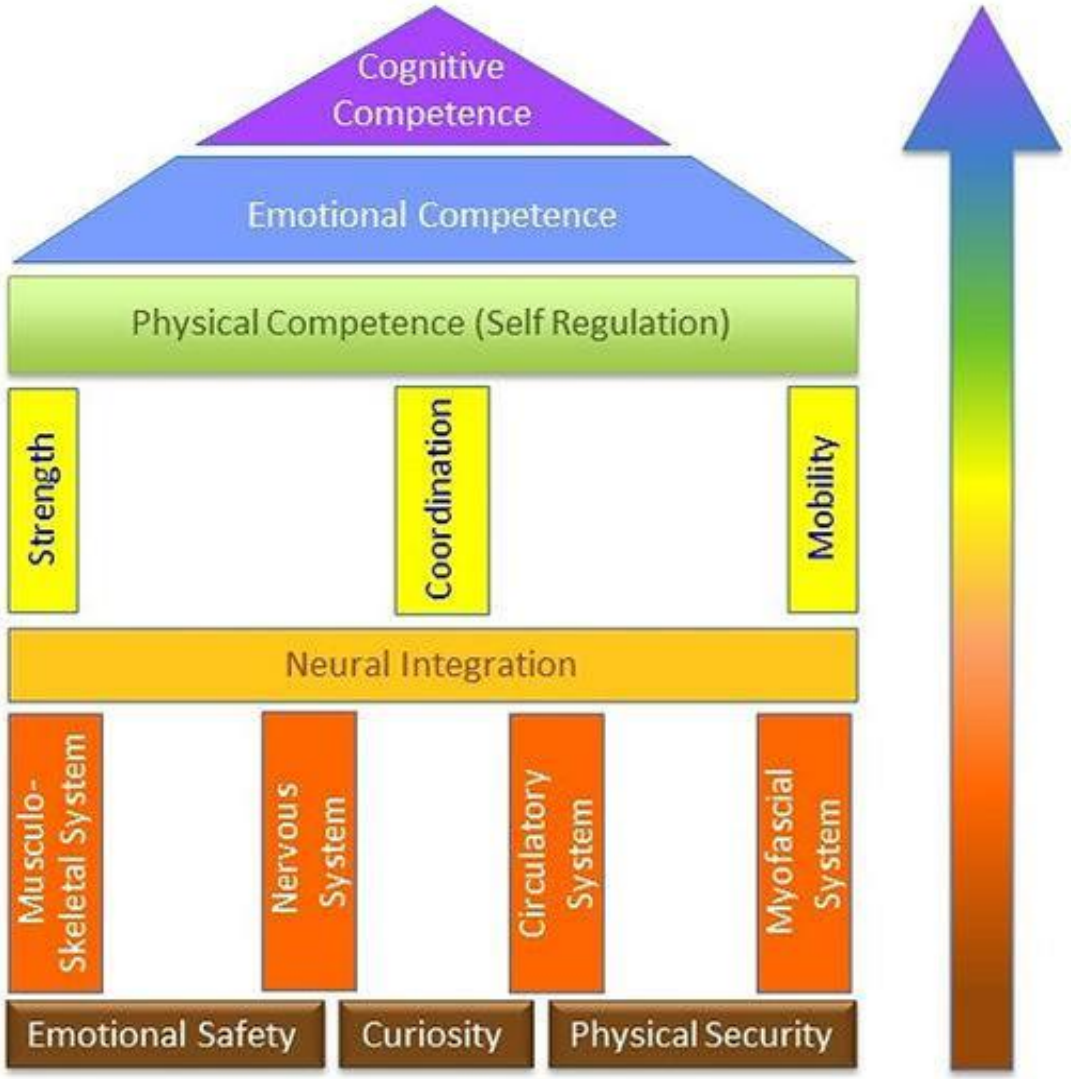
Neurological Foundations

EF Model



Model adapted from McCloskey by Woerner, 2016

Bottom Up Approach to Physiological & Psychological Wellness



Self-Regulation and Nature

Research

Self-Regulation and Nature Research

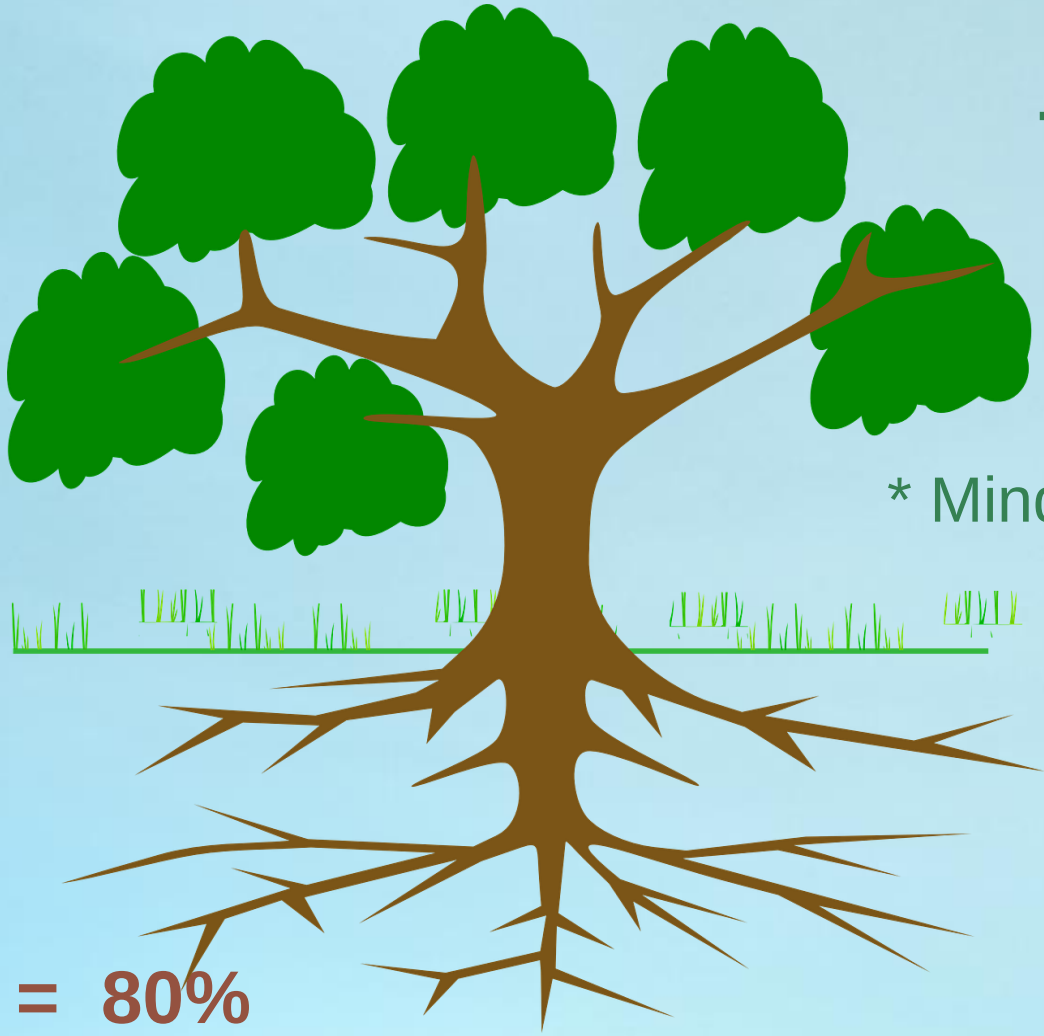
- (Beute et al, 2014) Nature helps us feel calmer and less irritable. This means that we are better able to control our impulses
  - Beneficial effects of a short exposure to nature on lower order self-regulation (e.g., controlling impulses) and also on mood and heart rate variability, a physiological measure related to exertion of self-control and stress.(Beute et al, 2014)
- This review found an inverse relationship between nature exposure and various physiologic markers of stress in all 7 studies measuring physiologic stress. Perceived stress was also affected by higher exposure to nature as indicated by lower self-reports on the PSS and DASS in 5 out of 6 studies measuring perceived stress (Shuda, 2020)
- green schoolyards support children's self-regulation development, and the higher the frequency of visits, and the more minutes weekly, the greater the gains. (Taylor, 2020)

Nature Enhancing Directed-Attention Research (Kaplan, 1995)

- Interacting with environments rich with inherently fascinating stimuli (e.g., sunsets) invoke involuntary attention modestly, allowing directed-attention mechanisms a chance to replenish
- The requirement for directed attention in such environments is minimized, and attention is typically captured in a bottom-up fashion by features of the environment
- In contrast, urban environments contain bottom-up stimulation (e.g., car horns) that captures attention dramatically and requires directed attention to overcome that stimulation (e.g., avoiding traffic, ignoring advertising, etc.), making urban environments less restorative.
- the logic is that, after an interaction with natural environments, one is able to perform better on tasks that depend on directed-attention abilities.

Self-Regulation and Nature

A Look at Neurophysiology



TOP DOWN = 20%

* Mind teaching the body
* Neurocognitive Approach
* Mind as the instrument for regulation

BOTTOM UP = 80%

* Body teaching the mind
* Neurophysiological Approach
* Body as an instrument for regulation

Homeostasis

A self-regulating process which living systems effort to maintain stability, while adjusting to conditions – to maintain an optimal state for survival.

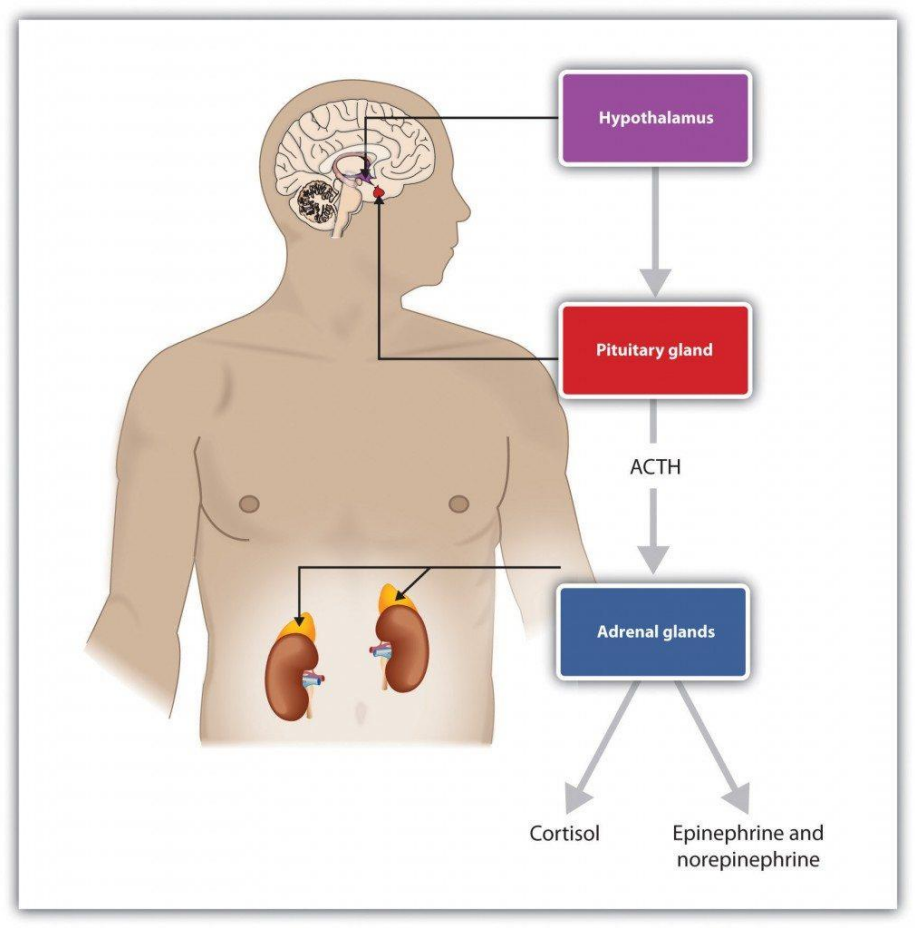
The human body works to maintain balance and regulate body functions under stress through collaboration of:

1. Nervous System – Neurotransmitters
2. Cardiovascular System – heart pumping blood thru the system
3. Endocrine System – Hormones
4. Immune System – Antibodies

Hypothalamus

- Links the endocrine and nervous systems
- Tells the Pituitary gland to start or stop making hormones
- A centrally located 'switching station' within the brain
- Complex with multiple components that control many different body functions
- Regulation of blood pressure, hunger immune responses, body temperature, maternal behavior, just to name a few.
- Coordinates circadian and seasonal body rhythms

HPA Axis



Hypothalamus – triggers release of CRH (Corticotrophin Releasing Hormone) which activates the Pituitary Gland.

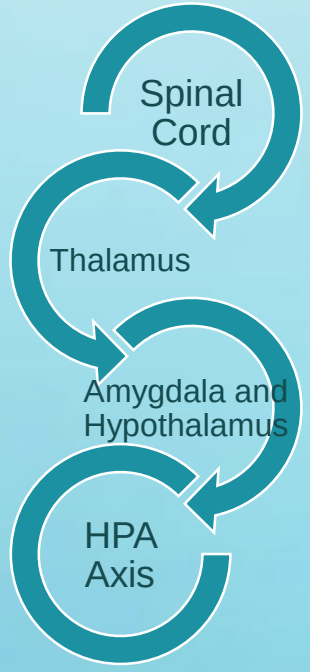
Pituitary Gland – The "Master Gland" that produces and releases hormones that control many bodily functions.

Adrenal Glands – release stress hormones: Cortisol, Adrenalin, Noradrenalin

Types of Stress:

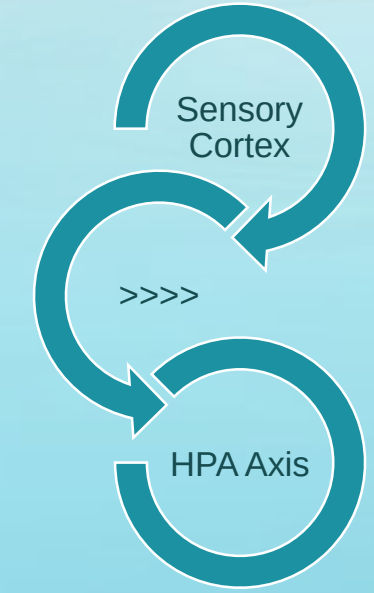
Physiological

- Illness
- Injury



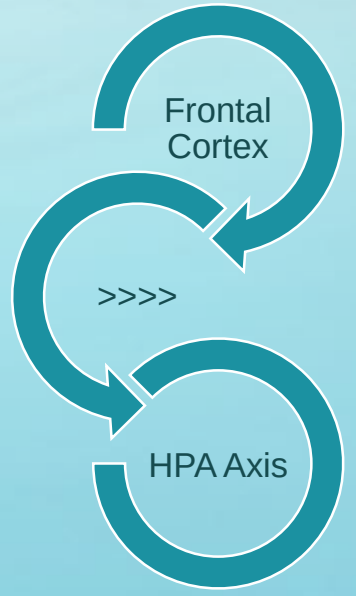
Perceptual

- Environmental Threat

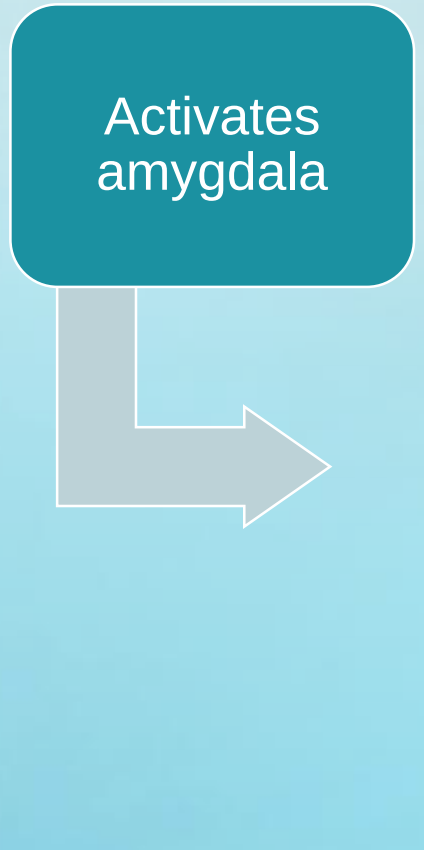


Imaginary

- Thoughts



Stress *(event or thought)*



- Interprets images, sounds, thoughts (perception)
- The command center – activates SNS
- Into bloodstream

Reticular Activating System

A network of neurons (white matter) in the brainstem that filters incoming sensory information (particularly *vestibular*) and integrates many functions.

It decides what information to pass through to the brain to help with automatic responses and important functions such as: sleeping and waking, breathing, heartbeat.

Regulates muscle tone and arousal, plays a role in fight-or-flight response, wakefulness and *behavioral motivation*.

Connects to the hypothalamus and thalamus

The Reticular Formation:

REGULATES:

- Arousal (in coordination with the Limbic System)
- Attention and awareness
- Cardiac Reflexes
- Motor Functions
- Level of wakefulness (asleep, awake, alert, attending)
- Generates circadian rhythms
- And relays nerve signals to the cortex

The RF is the primary part of RAS

- Processing information is not possible without this system and is only possible to the extent in which it is functioning properly or efficiently.
- *Determines whether a child will be impulsive, hyperactive, highly motivated or if they will be able to learn and remember.*
  - *Overactive RAS* -- easily startled, hyper vigilant, may need to self-stimulate by rocking, touching something, and may talk incessantly
  - *Underactive RAS* -- difficulty learning, absent-mindedness, lack of self-control and at its extreme, coma

Side Note: Children who have Sensory Processing Disorder (SPD) have been shown to have a depressed Reticular Activating System (RAS) on PET Scan.

Central Vestibular Receptors:

Vestibular nuclei located in brainstem has connections to:

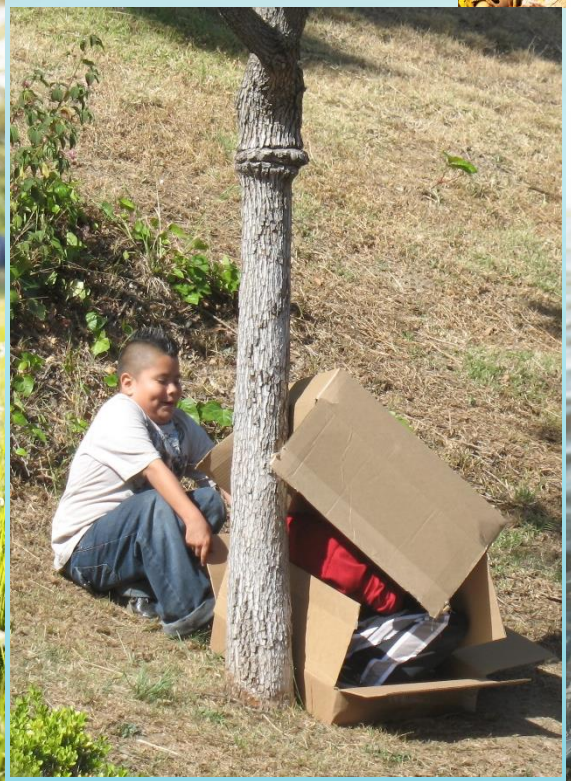
- Contra-lateral vestibular nuclei
- Muscle/joint proprioceptors
- The cerebellum -- balance
- The reticular formation -- affects alerting and arousal levels

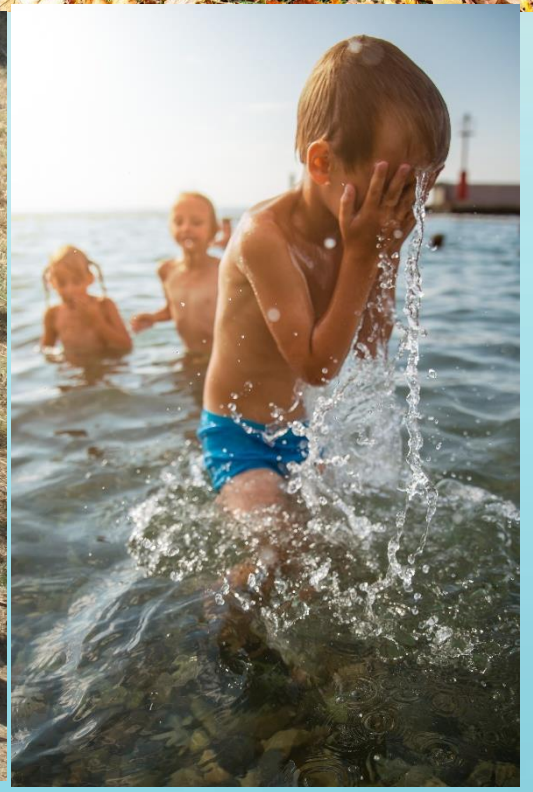
Limbic Brain (emotional mind) Functions:

- A collection of structures that modulates, dampens and regulates fluctuations in attentional responses through coordination of the autonomic, somatic, and behavioral systems

  - Process novelty and inconsistencies
  - Control behavioral patterns through motivational reinforcement
  - Affect arousal through feelings, anticipation and motivation
  - Regulate emotional states
  - Regulate sleep-activity cycles (with reticular formation)
  - Learning and long-term memories
  - Survival mechanisms and self-preservation (pleasure/pain, fight/flight reactions, rage/violence).

More Innate and Intrinsically motivating Opportunities for Vestibular Outdoors





Emotional Well-Being

Neurological Foundations

Emotions vs. Feelings

Emotions

- The set of largely *unconscious* physiological, behavioral and cognitive responses triggered when the brain detects a positively or negatively charged stimulus
- These responses occur within both the brain and the body
- Directly observable through objective measurements

Feelings

- The *conscious* experience of emotional responses
- They are accounts *the mind creates* to represent the physiological phenomena generated by the emotional state
- Indirectly observable through subjective accounts

Emotional Wellbeing and Nature

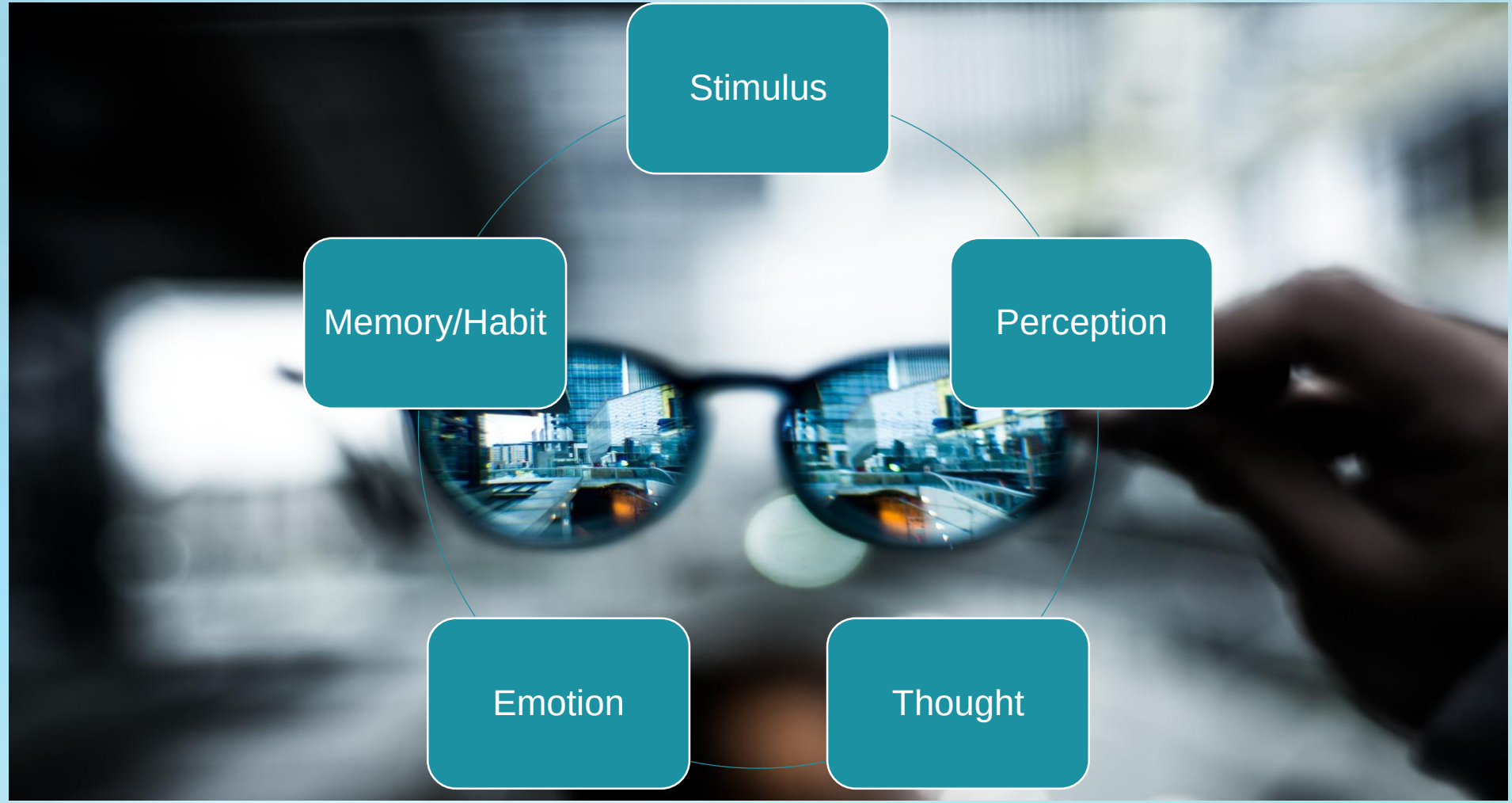
Research

- Hinds and Sparks (2011) noted that normally “negative” emotions of loneliness, isolation, and anxiety appear to be experienced more positively in natural environments.
- Individuals diagnosed with MDD exhibited cognitive and affective improvements after walking in a nature setting. These effects were observed even though participants were instructed prior to their walks to think about a painful negative experience, which has been shown to prime rumination (Kross & Ayduk, 2008), which in turn has been shown to disrupt working memory (Berman, et al., 2011). The fact that the nature walk was beneficial even while participants were thinking of a negative autobiographical memory suggests that the walk could be beneficial even in the midst of heightened ruminative processes. positive affect changed differentially for the nature walk compared to the urban walk
- Brief nature contact reliably improved both hedonic and self-transcendent emotions, and the duration of contact in the range tested had no impact on this improvement (Calum, 2018)

Emotional Wellbeing and Nature

A Look at Neurophysiology

Reality is Subjective



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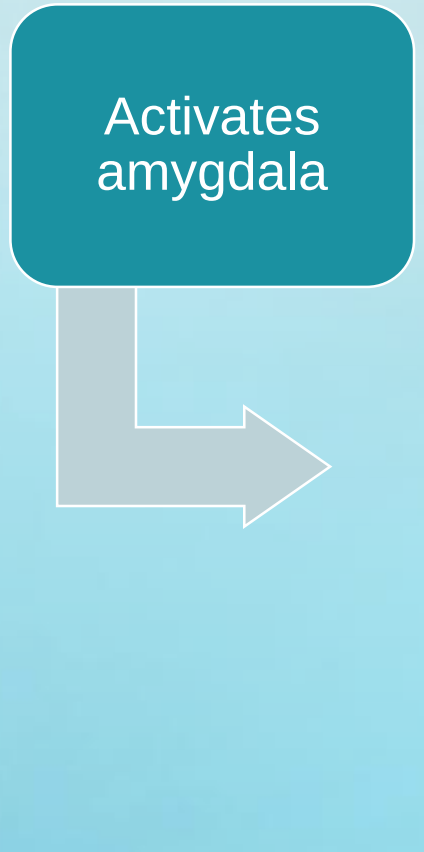

- Interprets images, sounds, thoughts (perception)
- The command center – activates SNS
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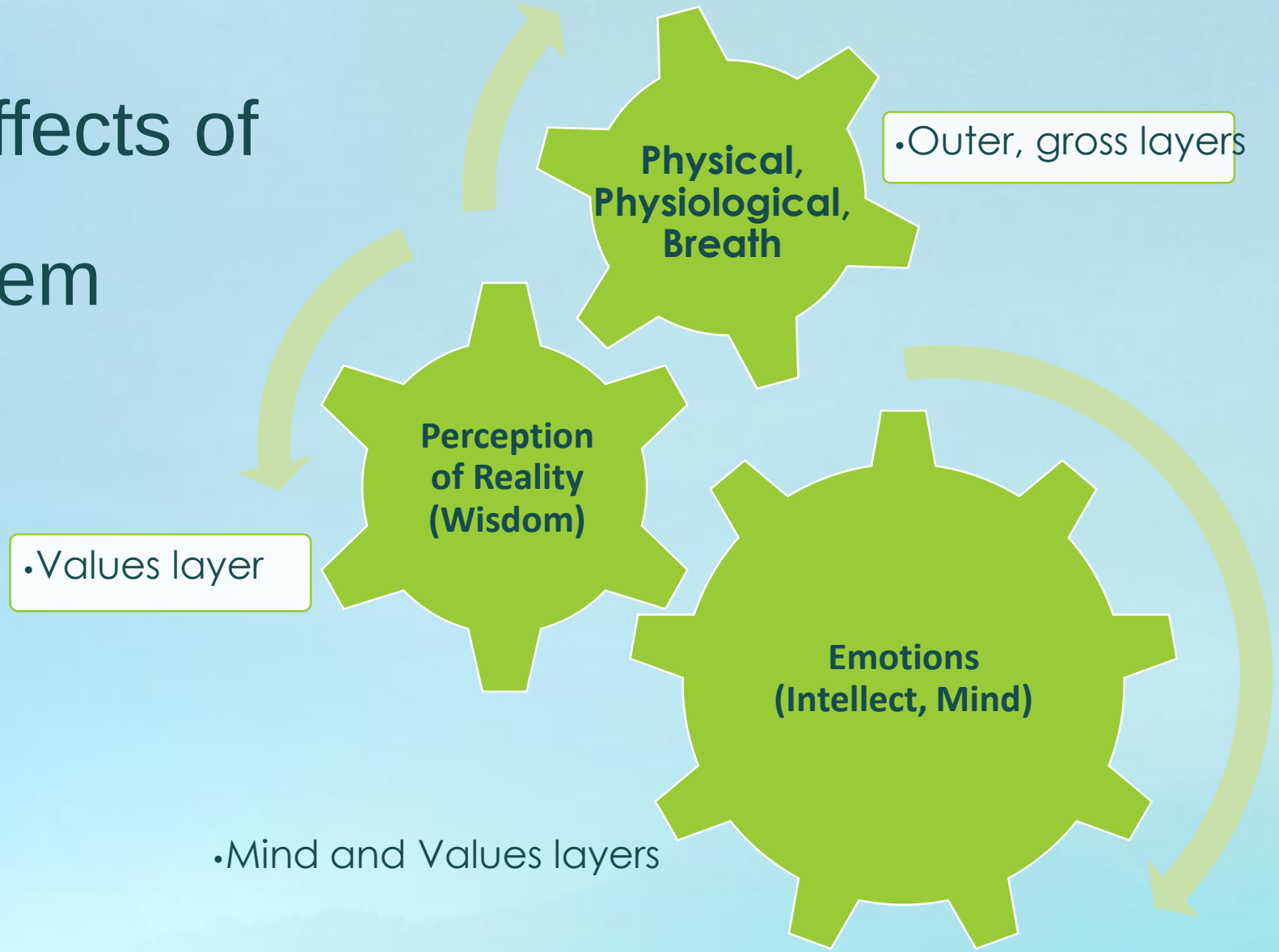
The Enteric Nervous System – The Gut-Brain

- Gut microbiota create biochemical signals that communicate between the GI tract and the CNS through different pathways (neural, immune and endocrine) and influences the body and brain, function and behavior.
- The system is complex and integrated, with afferent, efferent and interneuron connections with the central nervous system (via the Vagus Nerve) capable of carrying reflexes and acting as an integrating center in the absence of CNS input
- Several studies show that gut microbiota is involved in regulation of anxiety, pain, cognition and mood

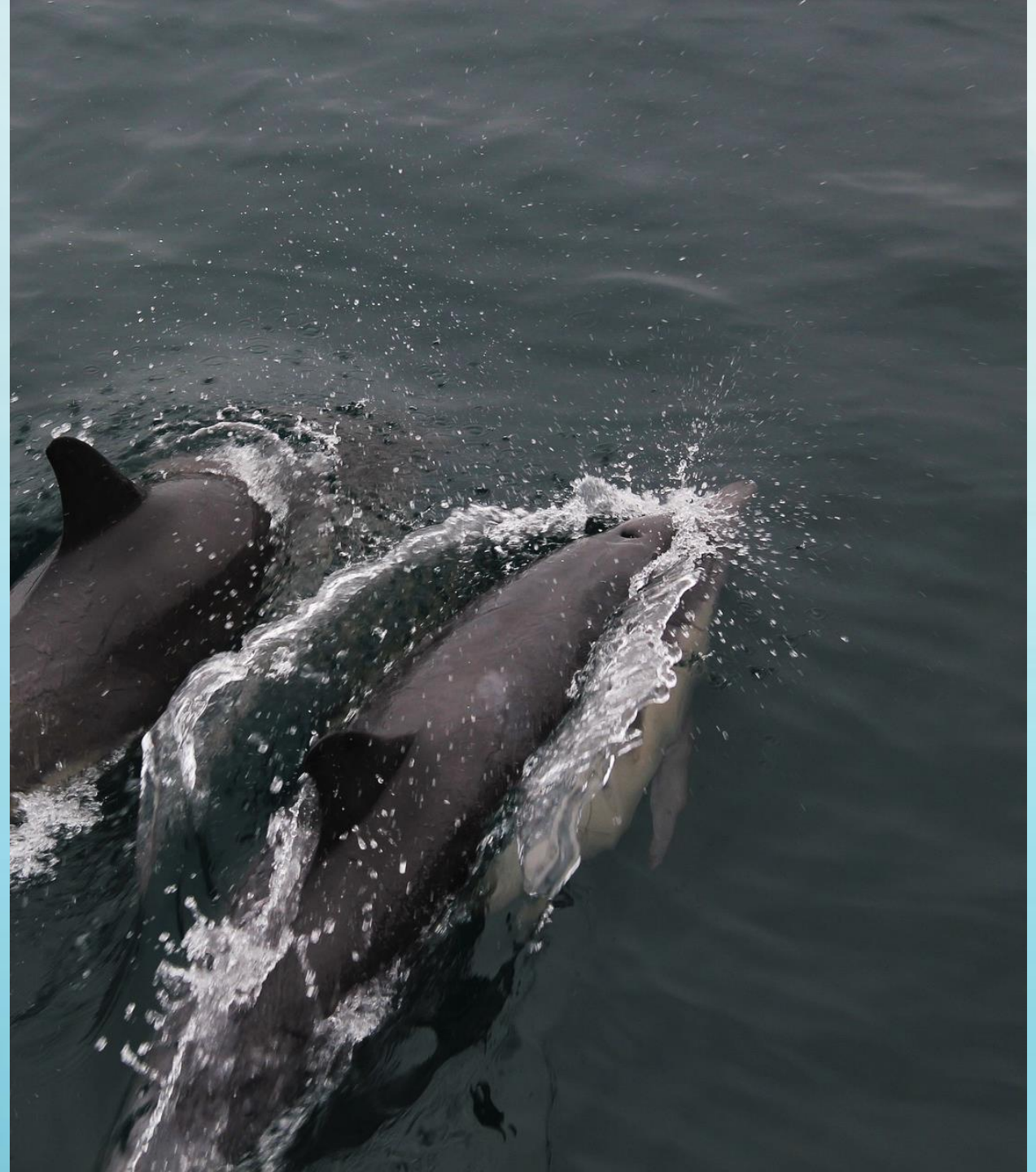
Gut-Brain *(continued)*

- More than 30 neurotransmitters (most are identical to those found in CNS) such as acetylcholine, dopamine and seratonin.
- About 50% of the body's dopamine (EF, motor control, motivation, arousal, reinforcement, reward)
- 95% of the body’s serotonin (important in regulating feelings of well-being, natural mood stabilizer) is found in the gut.

Interactive Effects of the System



- Outer, gross layers
- Values layer
- Mind and Values layers



Cognition

Neurological Foundations

Components of Cognition

- Attention
- Memory
- Receptive Language
- Perception
- Problem Solving
- Executive Function
  - Cognitive Flexibility
  - Inhibitory Control
  - Self-Monitoring
  - Task Initiation
  - Organization

Learning Requirements

1. **Motivation** – necessary to persist with determination when things become challenging

2. **Concentration/Reflection** – In order for our brain to absorb information, we must focus on the task and think deeply about it.

3. **Environment** – distractions can interfere with concentration

4. **Attainable Tasks** – in order to learn larger concepts and tasks, they must be broken down into small achievable steps

5. **Feeling Success** – without which it becomes too difficult to keep up motivation

Cognition and Nature

Research

- Performance on backwards digit-span significantly improved when participants walked in nature, but not when they walked downtown. In addition, these results were not driven by changes in mood, nor were they affected by different weather conditions. *(Berman et al, 2008)*.
- Children with ADHD concentrated better after a 20 minute walk in the park *(*

  Taylor et al, 2008)
- Several reviews have examined the impact of long-term exposures to nearby nature on students' academic achievement, but none has focused on the effects of short-term contacts with nature on students' cognitive performance. The aim of this review is to understand the context in which short-term passive exposures to greenness occur, how cognitive performance is measured, and the conditions under which cognitive benefits emerge at various educational levels. The review shows that in 12 out of the 14 studies, across educational levels, cognitive benefits emerge in terms of directed attention restoration from mental fatigue due to contact with nature. *(Mason et al, 2022)*
- Findings revealed that after a single lesson taught in the green school garden, children had greater selective attention and math calculation performance in two tasks than after a similar lesson in the classroom environment. *(Mason, 2022)*

A Walk in the Park Improves Concentration

“”Doses of nature’ might serve as a safe, inexpensive, widely accessible new tool in the tool kit for managing ADHD symptoms”

(Taylor et al, 2008)

A no-cost opportunity to sustain students’ cognition is a break in a green environment after mentally demanding activities

(Mason et al, 2022)

- Much research has provided support for the hypothesis that interactions with nature improve attention and memory

  - *Berto, 2005;*
  - *Cimprich, 1992, 1993*
  - *Cimprich & Ronis, 2003*
  - *FaberTaylor, Kuo, & Sullivan, 2002*
  - *Hartig et al., 2003*
  - *Ottosson & Grahn, 2002*
  - *Tennessen & Cimprich, 1995*

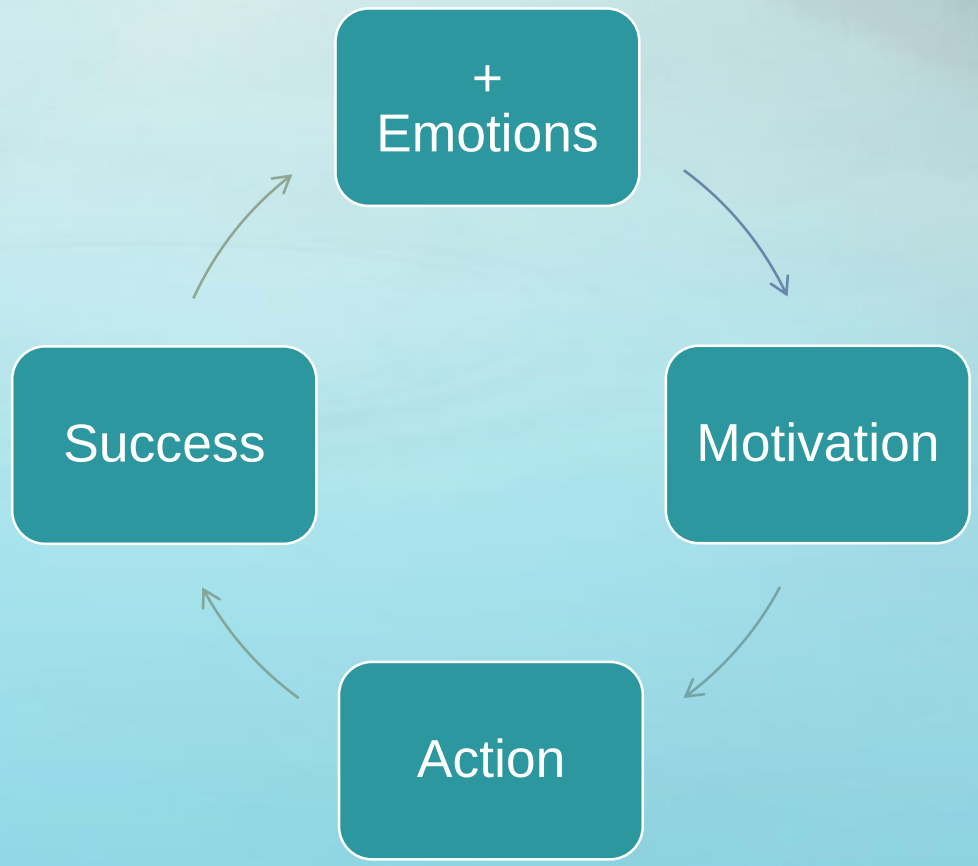
➢ Research has shown that merely viewing pictures of nature can have restorative benefits *(Berto, 2005).*

Cognition and Nature

A Look at Neurophysiology

Emotions and Goal-Directed Behavior

- Emotions serve as rewards for motivated behavior
- Much of human activity is driven by affect-regulating goals
- We often do things that we anticipate will make us feel better.
- Having performed an action that results in pleasant feelings leads to a greater likelihood of behaving similarly in the future.



Intrinsic Motivation

Desire to do things because they matter, because we like it, find it interesting, or is a part of something important

Operates on principles of:

1. Autonomy – urge to direct our own lives
2. Mastery – desire to improve at something that matters
3. Purpose – yearning to do something in service to something larger than ourselves

Dopamine, Motivation and Learning *(Ng, 2018)*

- Dopamine aids in controlling the brain's reward and pleasure centers, as well as motivated and emotional behaviors
- Dopamine neurons that are excited by unexpected reward events project to the striatum, cortex, limbic system and hypothalamus, thus affecting *physiological* functions and motivated behaviors.
- Dopamine is considered a key substrate of intrinsic motivation, promoting attentiveness and behavioral engagement
- For instance, participants were likely to voluntarily engage with the task during a free-choice time period or a self-determined choice condition
- These consistent findings indicate that an enhanced activity within the dopaminergic value system whereby perceived autonomy support promotes intrinsic motivation.
- Learning is a neural process that requires the reinforcement of synaptic functioning and is strongly mediated by dopamine and attentional gain in the frontal cortex

Intrinsic Motivation

- Engagement
- Supports flow
- Purpose/Meaning
- Makes desired actions desirable
- Promotes flexible thinking
- Supports autonomy
- Increases productivity

Extrinsic Motivation

- Compliance
- Creates stress
- Dulls thinking
- Blocks creativity
- Makes desired action seem undesirable
- Narrows thinking (okay for specific goals)
- Management
- Slows productivity

Oxygen

- 90% of the body's energy is created by oxygen
- Nearly all of the body's activities are regulated by oxygen, from brain function to elimination.
- The ability to think, feel and act is derived from energy supplied by 02.
- Fresh air *generally* has higher levels of oxygen (and lower levels of pollution) than indoor air.
- Exposure to more oxygen causes the blood vessels in your lungs to dilate, which improves cleansing and tissue repair within them, and helps them exchange gases more easily.

Breath is seeking an efficient gas exchange (oxygen and carbon dioxide)

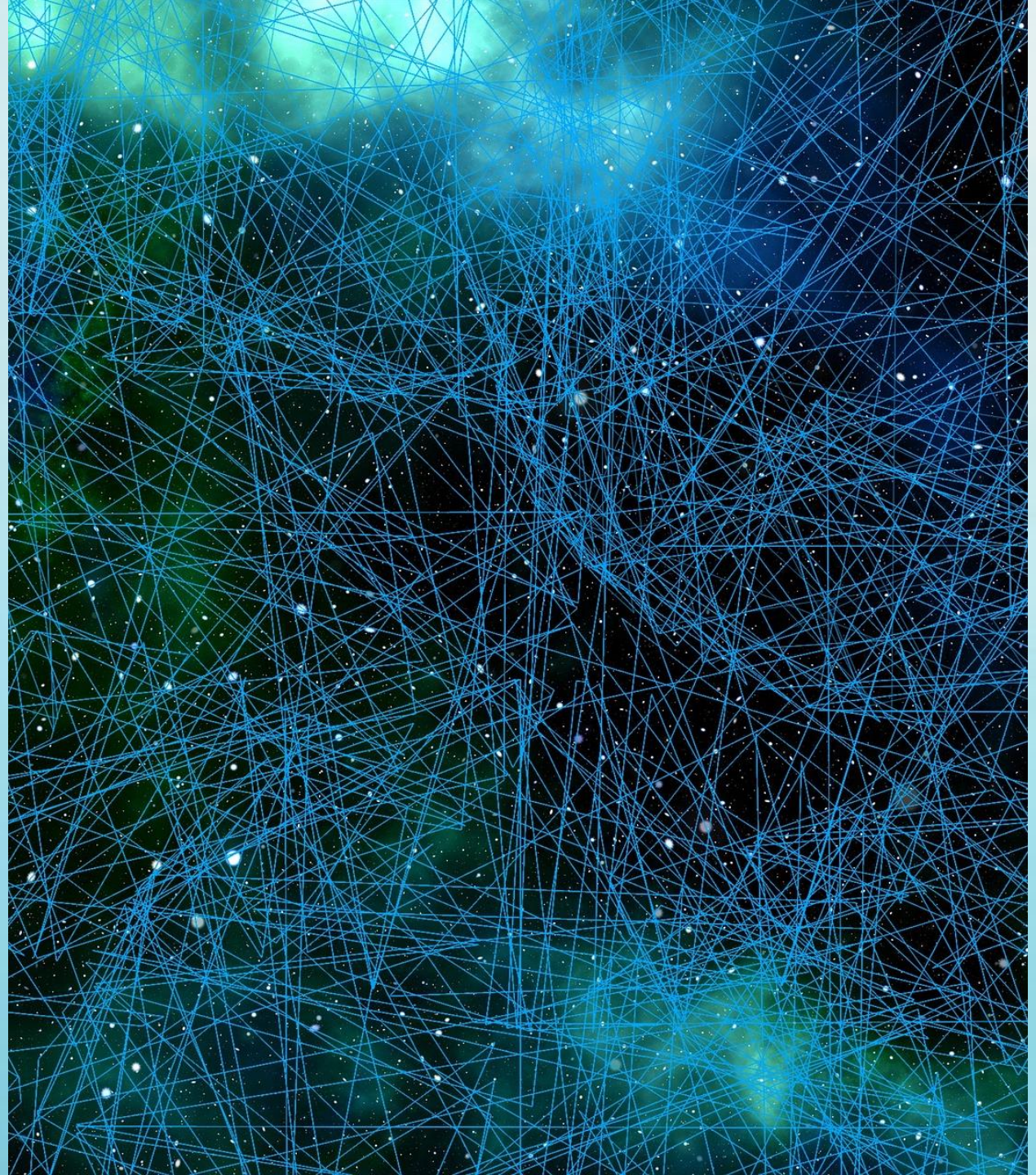
"Breath is the bridge which connects life to consciousness, which unites your body to your thoughts. Whenever your mind becomes scattered, use your breath as the means to take hold of your mind again."

~ Thich Naht Hanh

Everyone is a genius …

But if you judge a fish on its ability to climb a tree,
it will live its whole life believing it is stupid.

~ Albert Einstein ~



Social Engagement

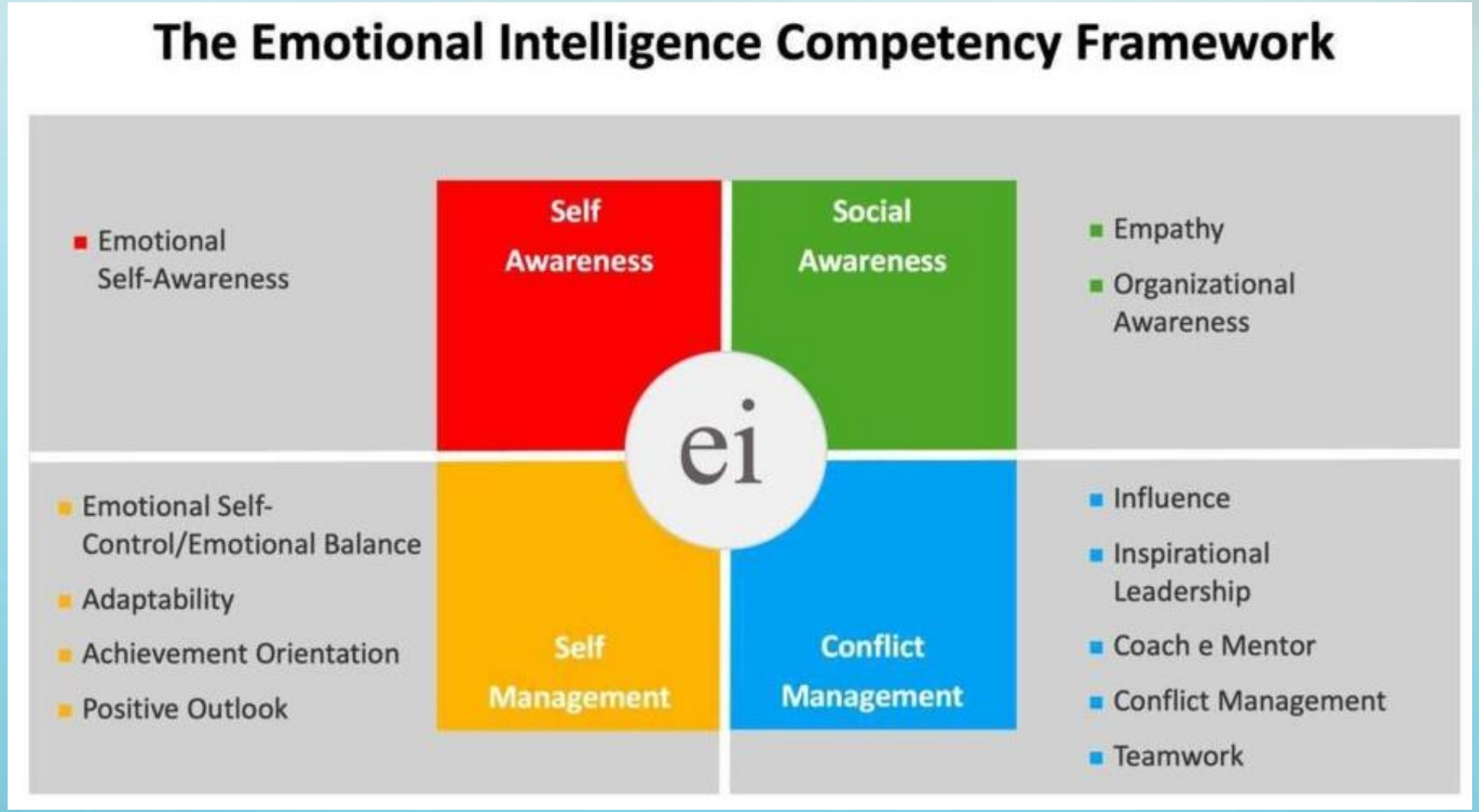
Neurological Foundations

Social Intelligence

- the ability to understand one's own and others' actions.
- learned and develops from experiences with people and from success and failures in social settings.
- An important interpersonal skill that helps with success in all aspects of life
- People with larger social networks and high quality relationships tend to be healthier
- People who experience social support feel less stress,

Emotional and Social Competency Inventory (ESCI)

Developed by Daniel Goleman, Richard Boyatzis, and the Korn Ferry Hay Group -- and builds on Goleman's model for emotional intelligence.



Social Engagement and Nature

Research

Animal Care Project *(Gilligan et al, 2021)*

- An animal-care project at a school in Dublin allowed the children to actively participate in caring for hens.
- Researchers used focus group discussions with children and interviews with teachers to evaluate socio-emotional benefits of keeping hens in school.
- Results from focus groups with the kids indicated gains in responsibility, empathy, respect for the natural world, cooperation, and relaxation.
- These same benefits were noted by the teachers, who reported improvement in motivation and peer-assisted learning processes.

Outdoor and Community-Based Free Play

(Loebach et al, 2021)

- Analyzed of outdoor and community-based free play of of 9- to 12-year-old Canadian children
- “Free play outdoors at home and around their communities has been linked to significant health and developmental benefits for children, including increased physical activity, environmental and social competence, creativity, and spatial skills.
- These benefits are generally reinforced when this activity takes place independently, without the direct supervision of adults.
- “The dramatic drop in Western children’s time and freedom to play outdoors and travel independently around their neighborhoods not only limits children’s opportunity to capitalize on these benefits but potentially compromises the instilling of key skills and competencies.”
- The association between interest in screen-based activities and lower time outdoors reminds us that outdoor play activities may not hold children’s interest as much as digital play particularly when independent mobility and peer interaction is limited and the nearby outdoor environment provides few appealing or accessible play opportunities.

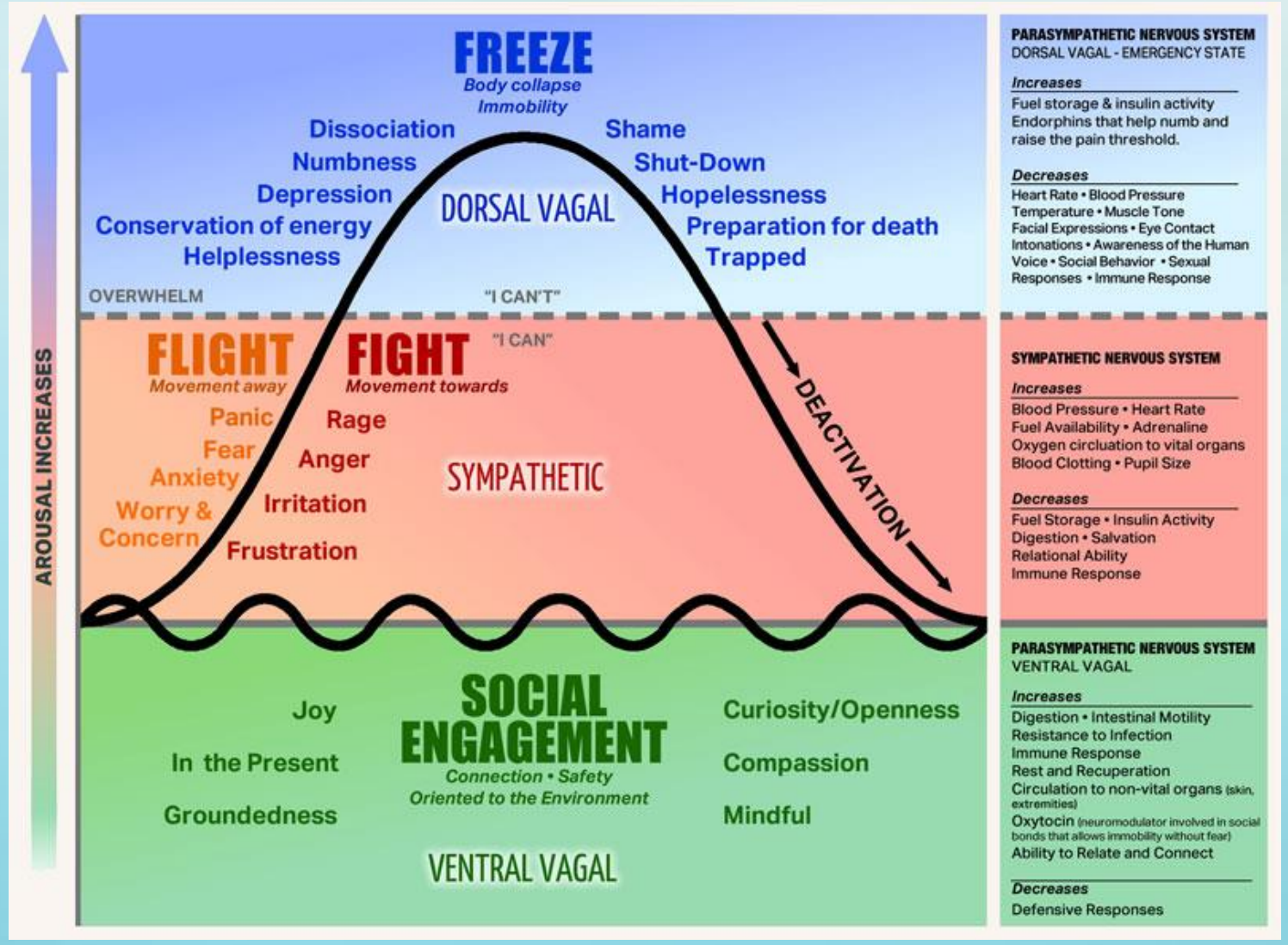
Forest Healing and Foster Kids *(Hong et al, 2021)*

- This study analyzed the impacts of forest healing programs on the psychological health of children in foster care. The program was run 72 times from 2015 to 2018 at National Forest Therapy sites.
- Self-reported surveys were administered before and after the program, and were used to determine the participants' interpersonal relationship skills. The results show a statistically significant overall increase of 1.77 points on average from 2015 to 2018.
- This study finds that forest healing programs can function as social promotion programs that utilize the forest's beneficial environment and the city's abundant resources, and that they represent an effective step toward improving the well-being of children in urban areas

Social Engagement and Nature

A Look at Neurophysiology

Polyvagal and ANS Response Considerations



Efficacy & Confidence

Neurological Foundations

Self-esteem, Confidence, Efficacy, Optimism

All are related to how a person feels about themselves, sense of self, and their abilities to succeed, and they can all contribute to a person's sense of well-being

- **Self-esteem** -- internal feelings and assumptions about self, worth and personality. People with high self-esteem tend to think positively about themselves and treat themselves with kindness
- **Confidence** – a general belief in abilities to perform tasks or achieve desired outcomes, comes from feelings of well-being, acceptance, and belief in one's skills and experience. Confidence is specific to a skill or situation, and can be built through positive experiences, feedback, and successes
- **Self-efficacy** is a more specific belief in one's ability to perform in a particular situation, comes from mastery experience, vicarious experience, social persuasion, and physiological and affective states -- Confidence can be built through positive experiences, feedback, and successes
- **Optimism** -- A positive attitude and expectation that good things will happen, and that things will work out in the end. Optimists tend to be less anxious, depressed, and higher achievers

“The Optimistic Child” *(Martin Seligman)*

- Seligman found that optimism can help children achieve more in school, improve their physical health, and build self-esteem
- Seligman and his colleagues found a link between pessimism and depression in a 30-year study. Pessimistic children are at a higher risk of depression than optimistic children
- Seligman found that optimism can help children achieve more in school, improve their physical health, and build self-esteem – and it can be learned.

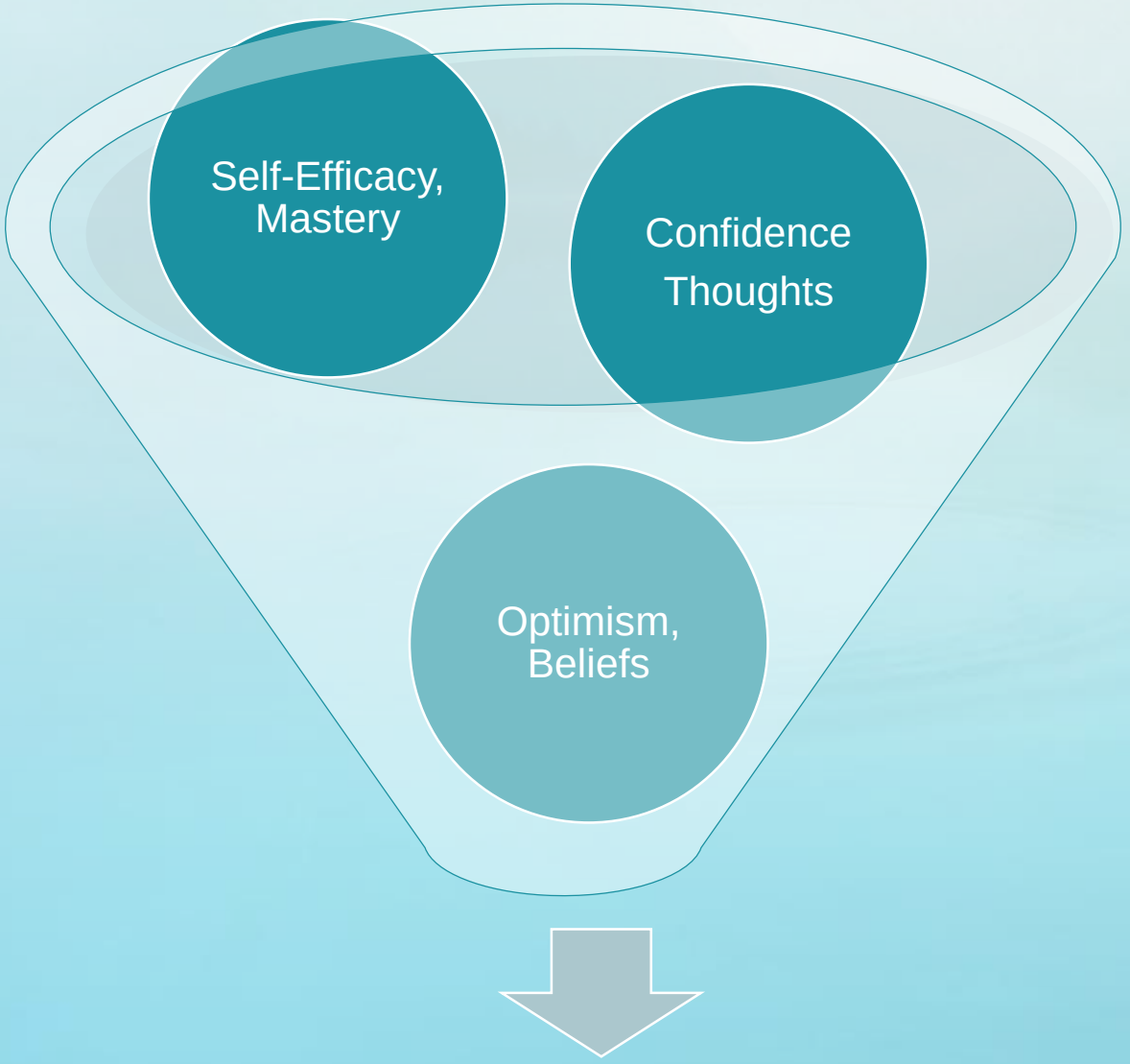
- Seligman found that self-esteem comes from overcoming frustration, mastering challenges, and experiencing achievement, rather than from being encouraged by others to feel good about themselves. By producing themselves
- Remembering it’s not: Permanent, Pervasive or Personal
- ABCDE model, which involves asking yourself questions about your negative thoughts:
  - Adversity: What event caused the negative thoughts?
  - Belief: How do you feel about the event?
  - Consequence: What behaviors came from your feelings about the event?
  - Disputation: What examples of events prove your negative beliefs wrong?
  - Energization: How does challenging your negative beliefs inspire you to move forward?

Thought Patterns and ANS

- Negative thought patterns cause unhealthy levels of anxiety and stress
- Many negative thoughts are a misrepresentation of what *may* pose a threat
- In response to a negative thought, the body's protective mode/parasympathetics take over and cut off communication with thinking part of the brain (EF) by switching the learning mode off.
- Negative thoughts cause one to move away from the feelings of vulnerability, resulting in reactive behaviors that avoid, numb or eliminate painful emotions, and decrease EF development

Optimism *(cont.)*

- “To emerge from helplessness … (a child) must develop voluntary responses to bring about desired consequences.” It is difficult to engage when your head is full of negative thoughts, or when attempting to avoid them. *(Seligman)*
- “The feeling of self-esteem is a byproduct of doing well.” *(Seligman)*
- Irrespective of differences in school grade and in cognitive ability, self-efficacy exerted significant influence on various aspects of self-regulation, such as monitoring of working time, task persistence, and rejection of correct hypotheses, as well as on performance. *(Bouffard-Bouchard)*

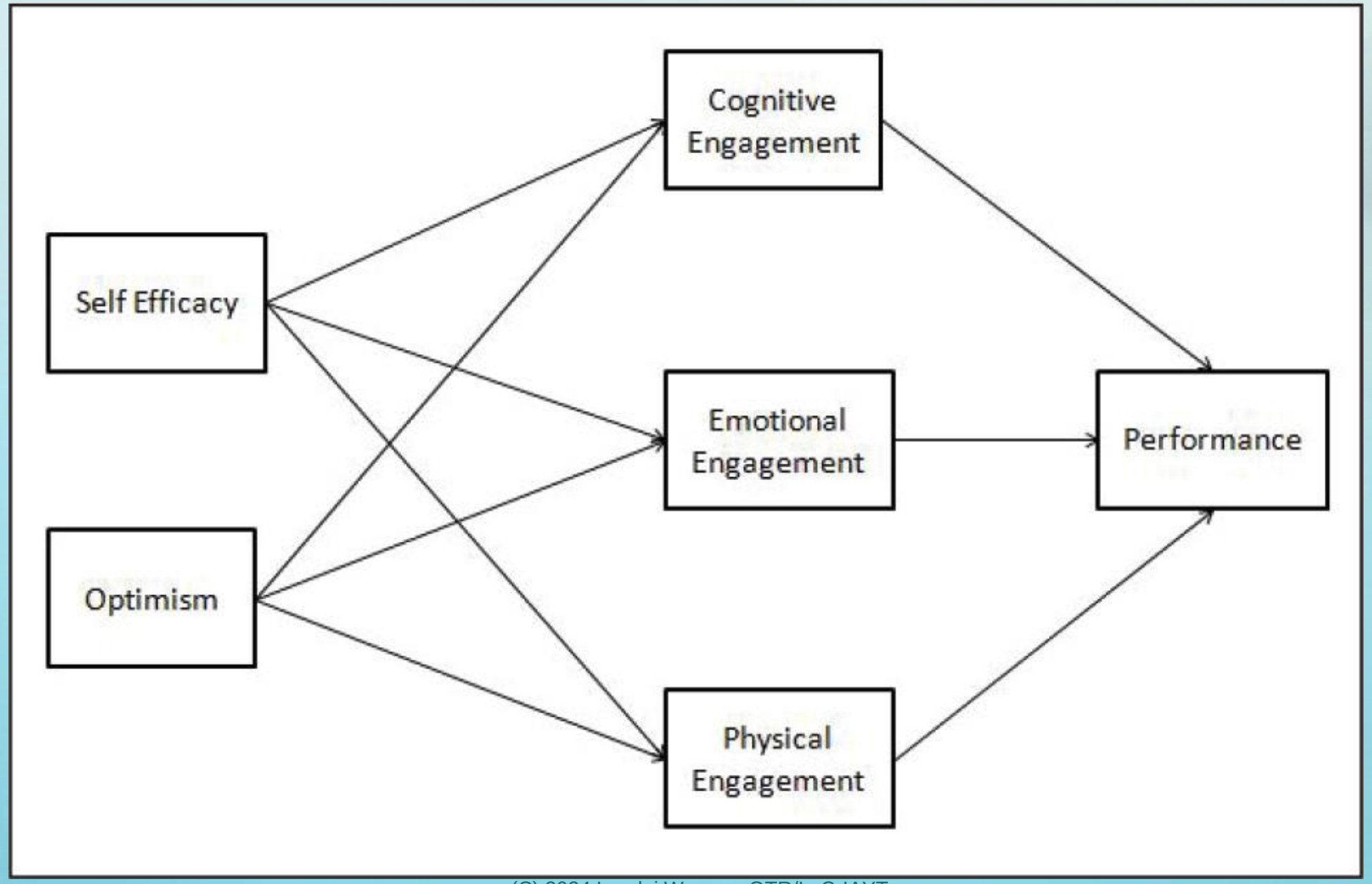


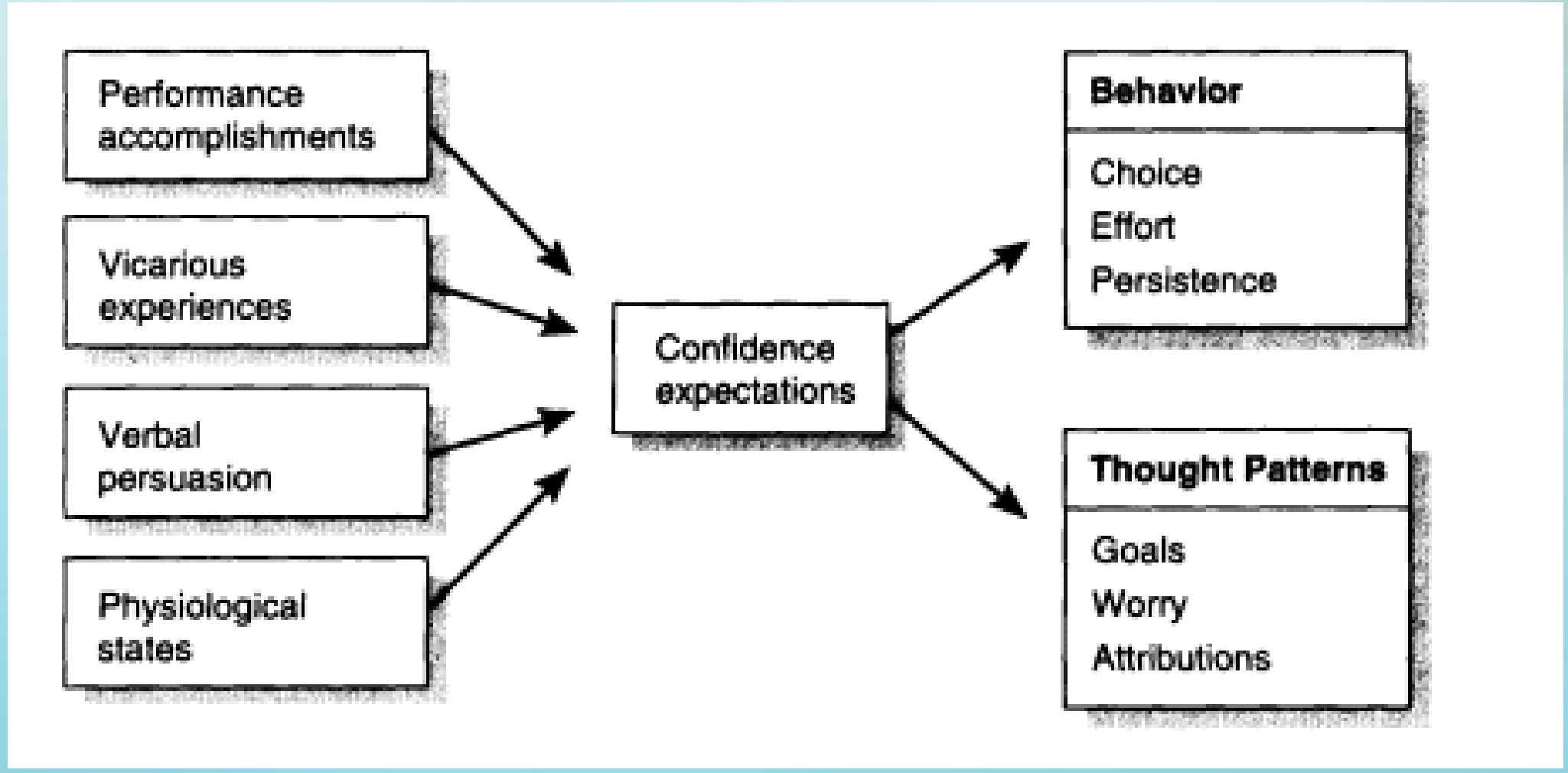
Self-Esteem

Confidence gives us a boost. It energizes efforts, giving optimism and conviction that we will succeed in what we are undertaking.

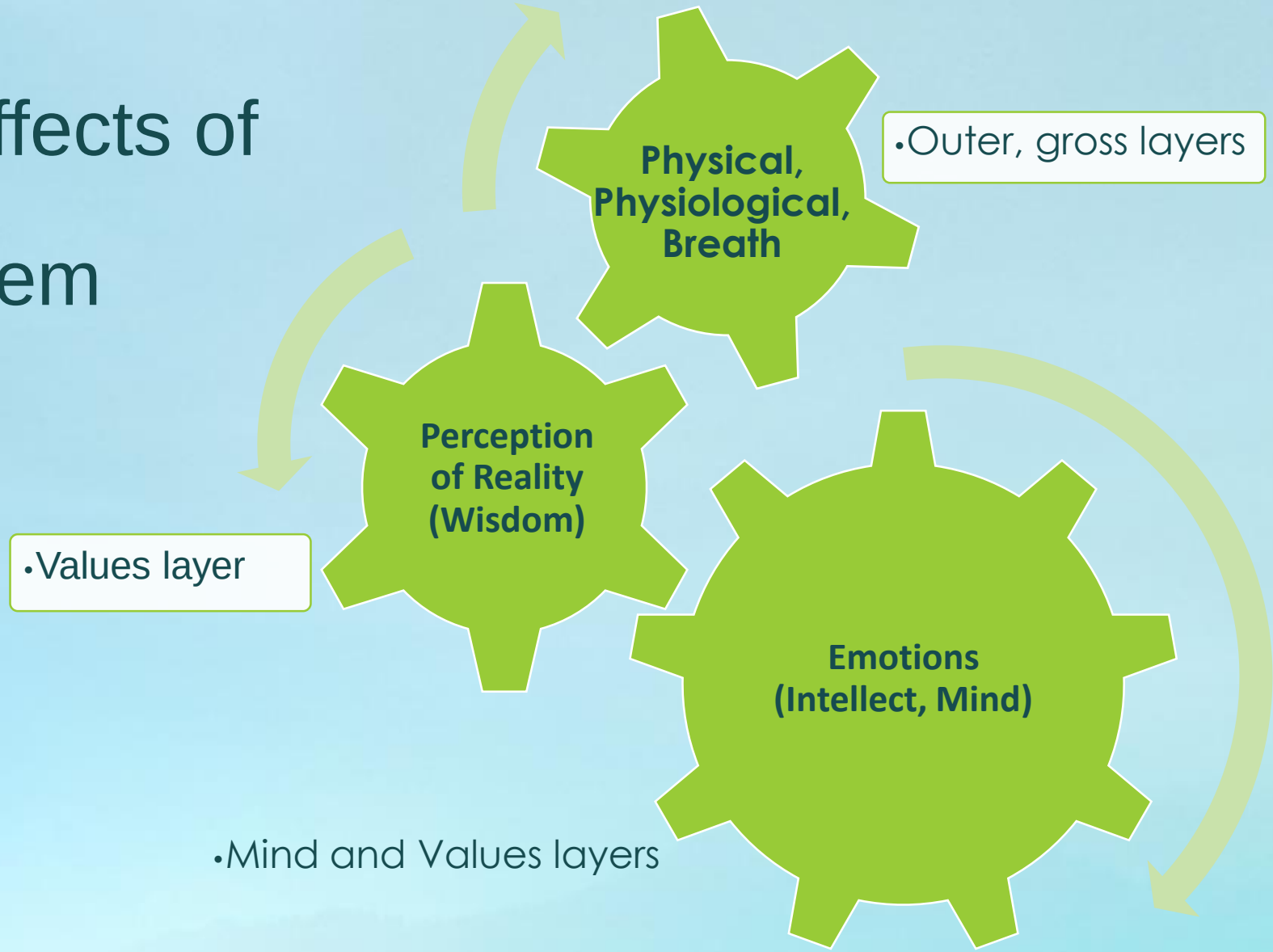
With that comes greater energy, focus, and motivation.

We experience less anxiety and less fear and live more freely.

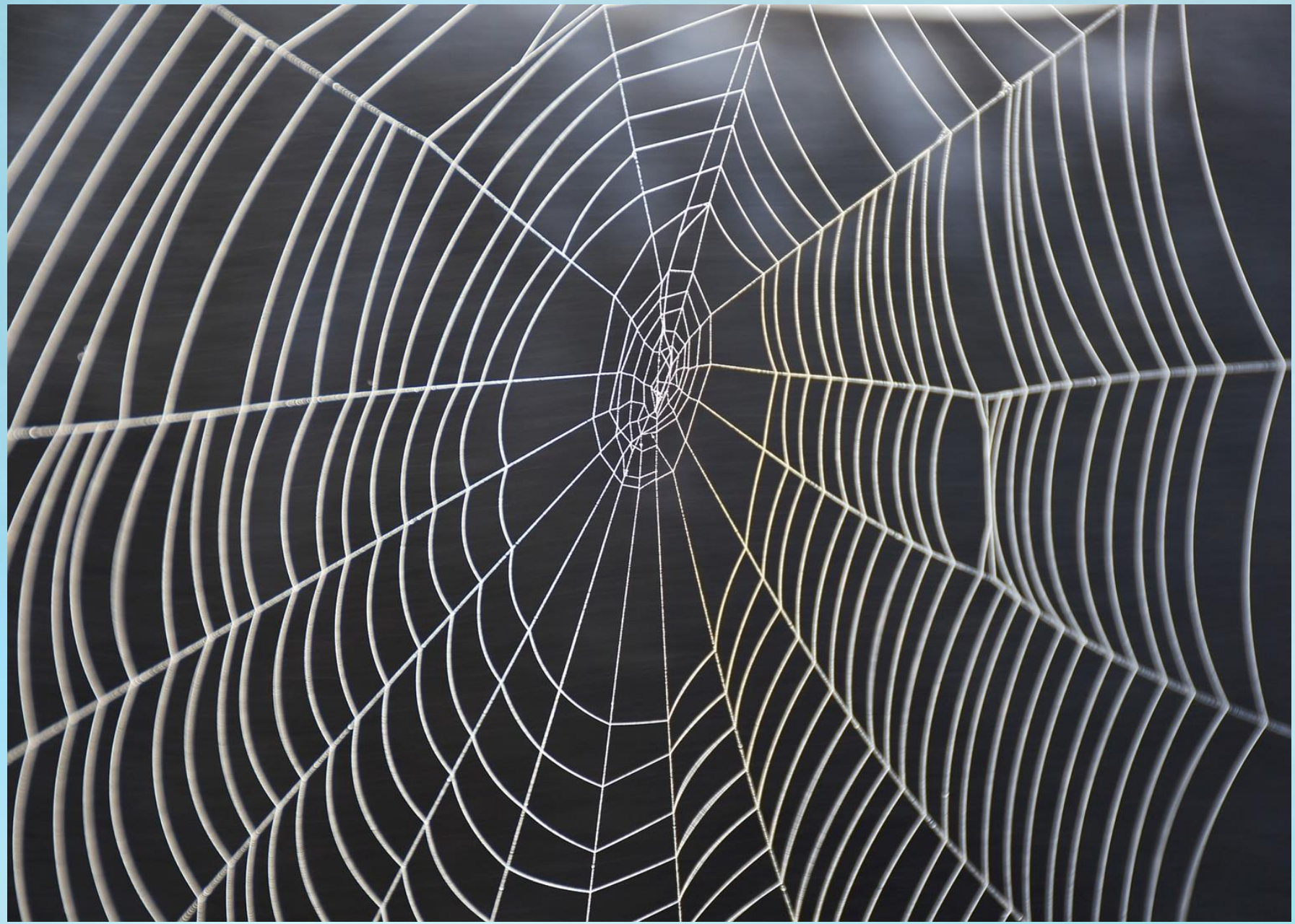

Cognitive Engagement
Self Efficacy
Emotional Engagement
Performance
Optimism
Physical Engagement


Performance accomplishments
Vicarious experiences
Verbal persuasion
Physiological states
Confidence expectations
Behavior
Choice
Effort
Persistence
Thought Patterns
Goals
Worry
Attributions

Interactive Effects of the System



- Outer, gross layers
- Values layer
- Mind and Values layers



Efficacy & Confidence and Nature

Research

Forest School Programs *(Blackwell, 2015)*

- Forest School programs are child centered and are deliberately designed to promote the holistic development of the child.
- The aims of this study were to establish the impacts of long term forest school program on children's resilience, confidence and wellbeing.
- Using illuminative evaluation, this research study analyzed articles, research studies and case studies on outdoor learning and then evaluated the impacts of Forest Schools.
- The notable findings were improvement on key resilient indicators, such as self efficacy, persistence, and problem solving skills. Also impacts on children's confidence were marked by increase propensity to take risks, heightened levels of self-belief, positive attitude, independence and increased tendency of taking initiative.
- In relation to children's wellbeing, long term Forest Schools programs were found to have positive impacts on children's physical and mental health in addition to improving their social and cognitive competence. The study found that promoting wellbeing in children enhances their confidence and resilience.

- Researching exercise verses countryside walks. A significant main effect for self-esteem and mood pre and post activity was reported after participating in a single session. The change in self-esteem was significantly greater in the green exercise group compared with the social activities club *(Barton et al, 2012)*
- This study investigates the relationship between outdoor life and the well-being and self-esteem of Swedish adolescents aged 12–15 years old. The study employed a questionnaire that was administered twice during a school year that included questions on time spent outdoors, environmental quality and the perceived benefit of the outdoor environment. Additionally, the study used standardized scales to measure life satisfaction, self-esteem and mental health. The results of the study revealed that adolescents who had more positive perceptions of their outdoor environment and being outdoors reported higher life satisfaction and self-esteem, as well as better mental health *(Wales, et al)*

Efficacy & Confidence and Nature

A Look at Neurophysiology

Confidence

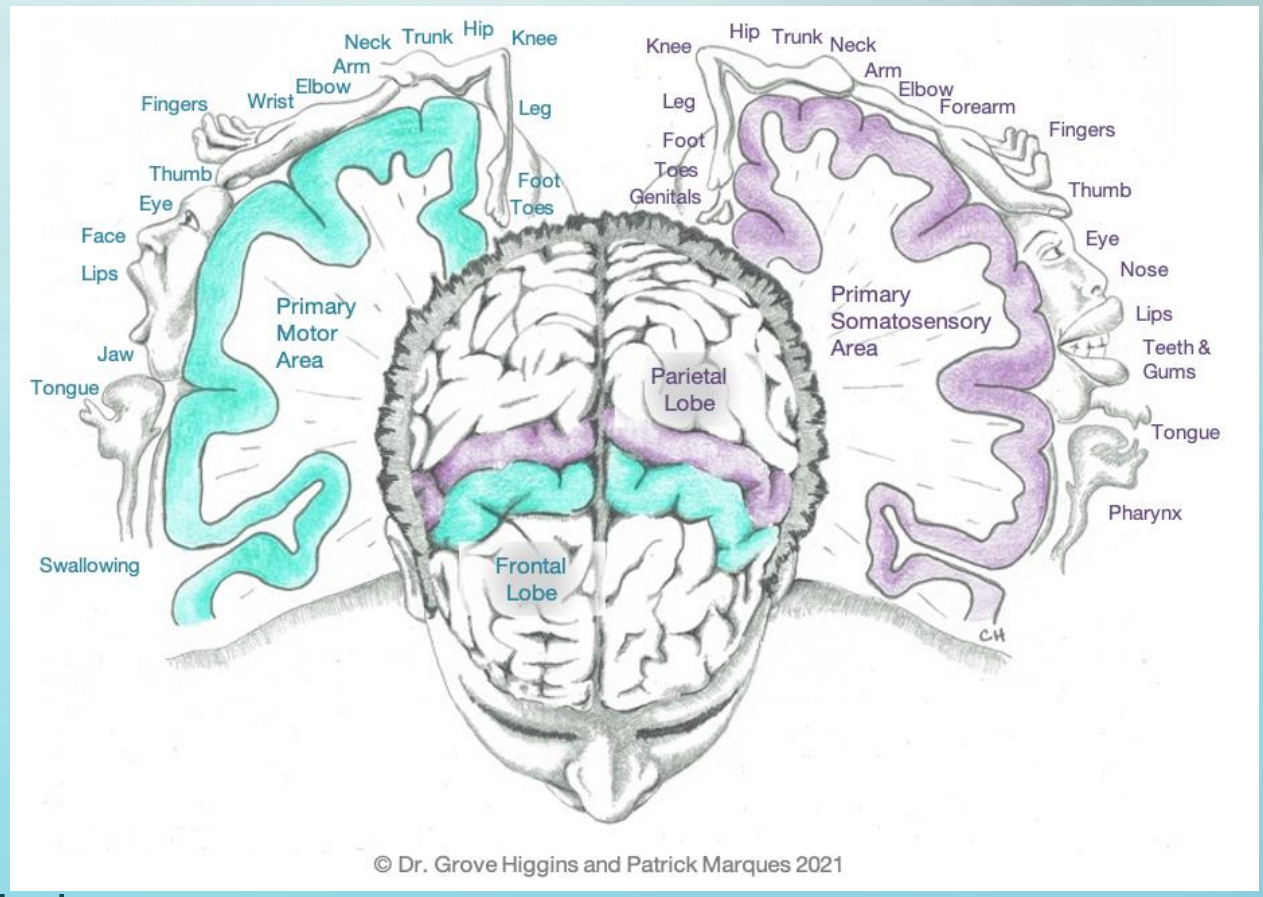
- By releasing endorphins → improved mood → reduced depression and anxiety → improved self perception
- Naturally enhances autonomy, competence and relatedness
- The prefrontal cortex, limbic system, amygdala, and hippocampus are all involved in confidence. The dorsolateral, medial, and rostrolateral prefrontal cortex are particularly important for decision confidence
- Dopamine, serotonin, endorphins, and oxytocin are all important for confidence. Dopamine is associated with motivation and reward, while serotonin is associated with well-being and happiness
- When we think positively, the brain's "value areas" are activated, including the striatum and prefrontal cortex. When we feel confident, circuits involved in reward and pleasure are engaged.

Self-Efficacy

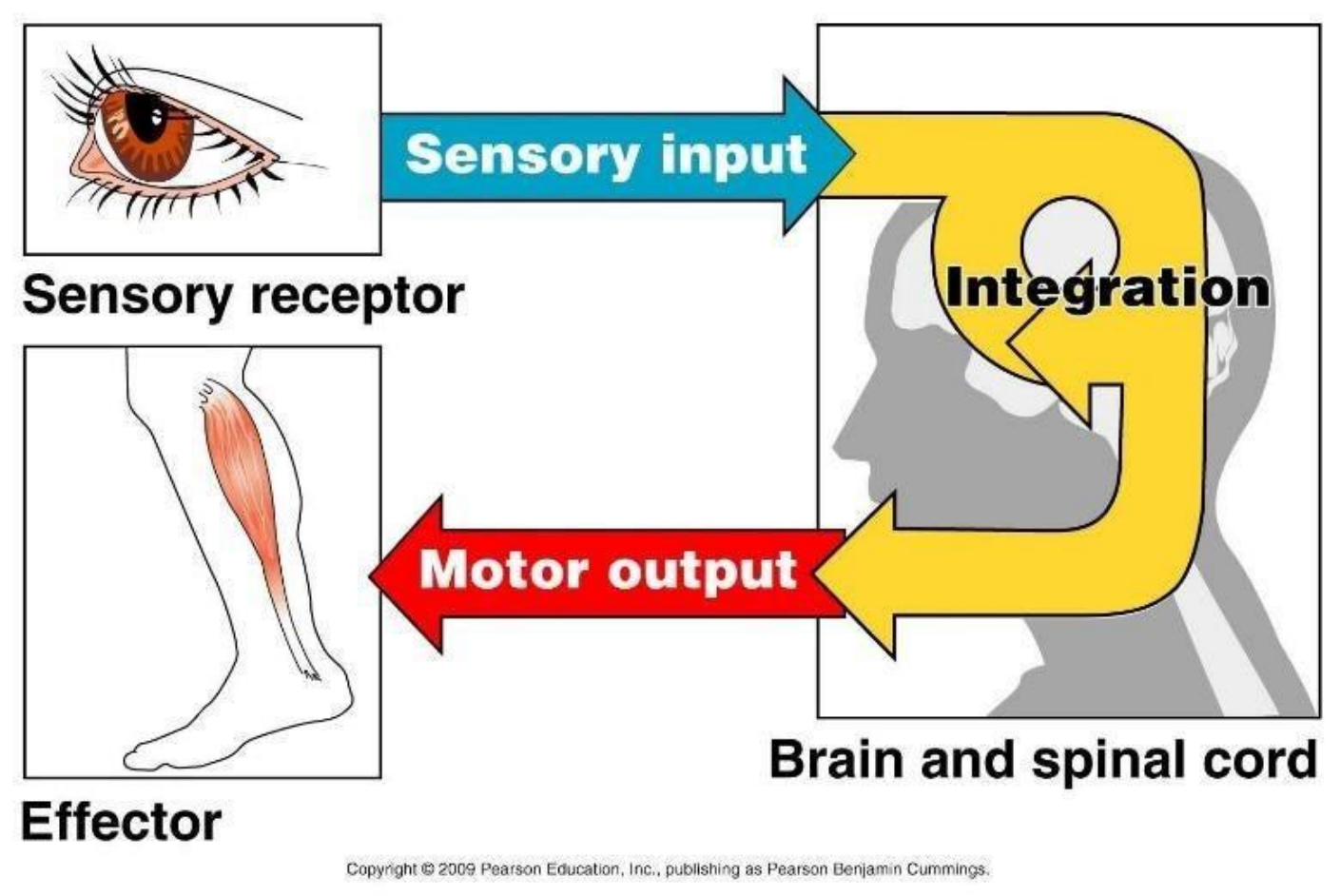
- When the brain anticipates success, it releases dopamine, which can improve performance. Dopamine can also increase brain plasticity, which helps the brain learn and rewire more quickly
- The neurochemical dopamine is linked to self-efficacy and can increase brain plasticity, which helps the brain learn and rewire more quickly.
- Improved inhibitory control and increased brain activity can result from self-efficacy. For example, students who pay more attention and have higher effortful brain activation tend to view tasks as being under their contro

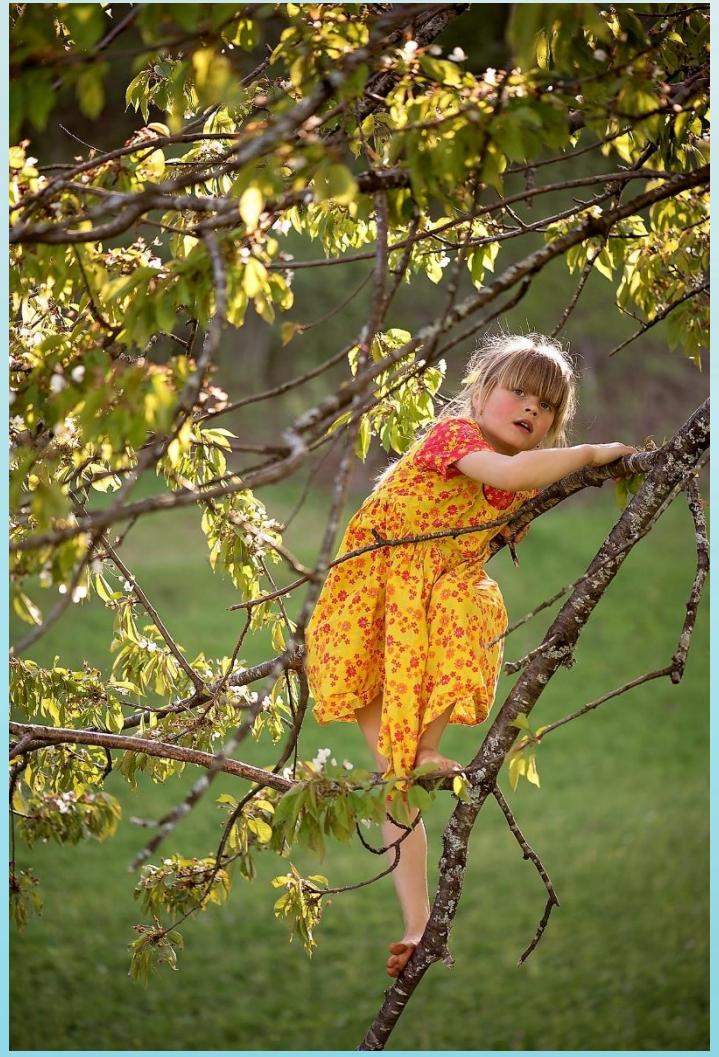
Senses – sensory input for motor output

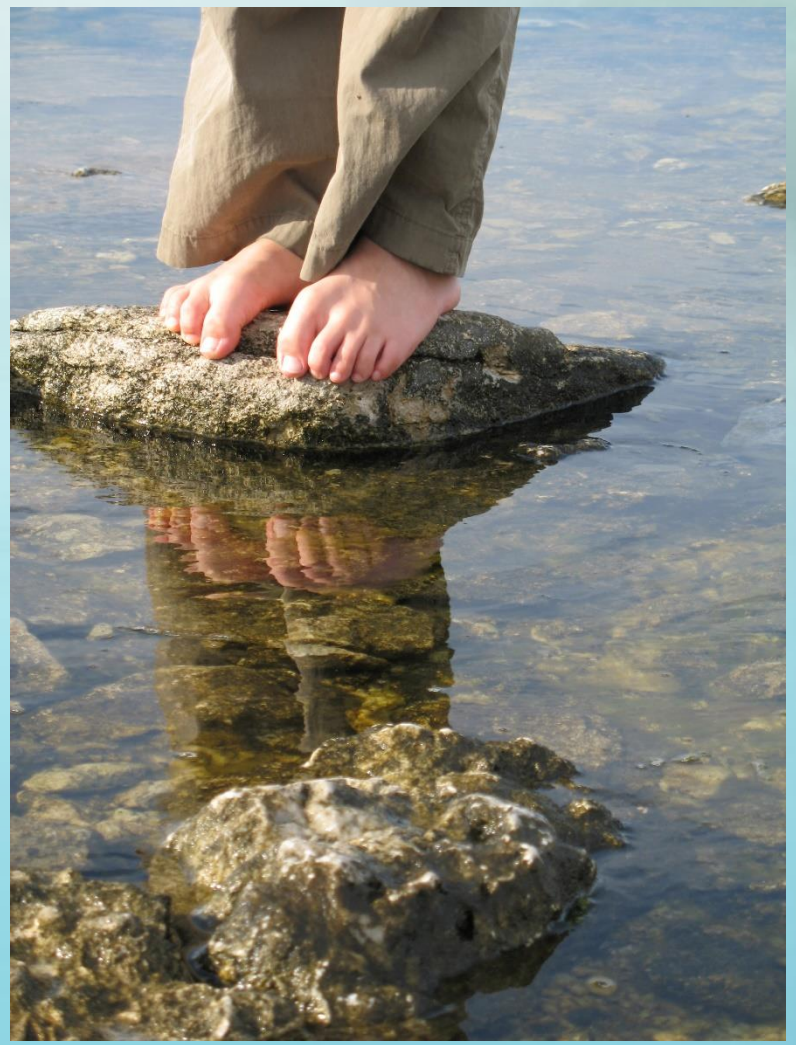
- Tactile
- Visual
- Auditory
- Olfactory
- Gustatory
- Vestibular
- Proprioception
- Interoception – gut, elimination,
- Neuroception
- Yoga Adds: Speech Organs and The Mind



Senses – sensory input for motor output







Positive Growth Mindset

- Belief that one can cultivate their qualities through effort. (A “fixed mindset” suggests that the ability to learn is a pre-determined, inherent quality)
- It is critical to developing a learning-oriented behavior
- Students learn to view their effort in a positive way and feel that they have abilities, through their own efforts, to learn and master new material.
- Acknowledges that troubled, disabled and struggling youth can enhance their abilities to learn through their own effort, in an environment of encouragement and compassion.
- Supports a development of optimism and self-esteem.
- Self-esteem is founded in a person’s own efforts and results, not in another’s opinions or statements about their achievements.

Positive Growth Mindset research

- Adolescent students were divided into two groups for a workshop on the brain and study skills. The control group, were taught about the stages of memory; the other half received training in the growth mindset (how the brain grows with learning to make you smarter) and how to apply this idea to their schoolwork. Three times as many students in the growth mindset group showed an increase in effort and engagement compared with the control group. After the training, the control group continued to show declining grades, but the growth-mindset group showed a clear rebound in their grades. *(Blackwell et al)*

- Students who hold a growth mindset use more sophisticated strategies in their coursework. They use more complex cognitive and meta-cognitive strategies–those that involve active and deeper-level processing of material, and self-monitoring of the learning process. *(Dweck)*

Positive Growth Mindset

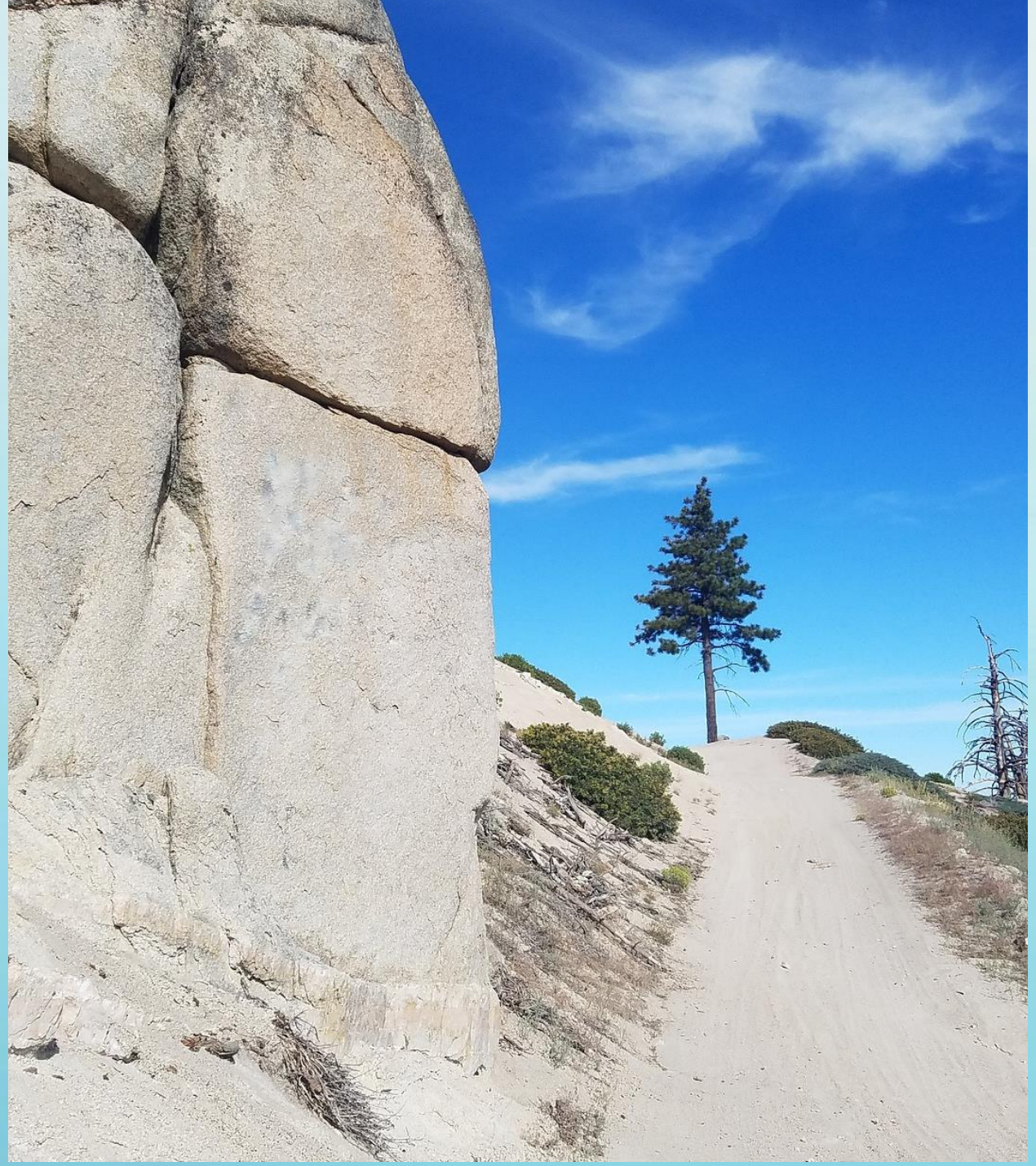
Teaching students “Growth Mindset” -- how the brain grows with learning to make you smarter, how the brain functions, learns, and remembers, and how it changes in a physical way when we exercise it --

shows students that they are in control of their brain and its development.

It teaches them about neurogenesis, optimism and self-awareness.

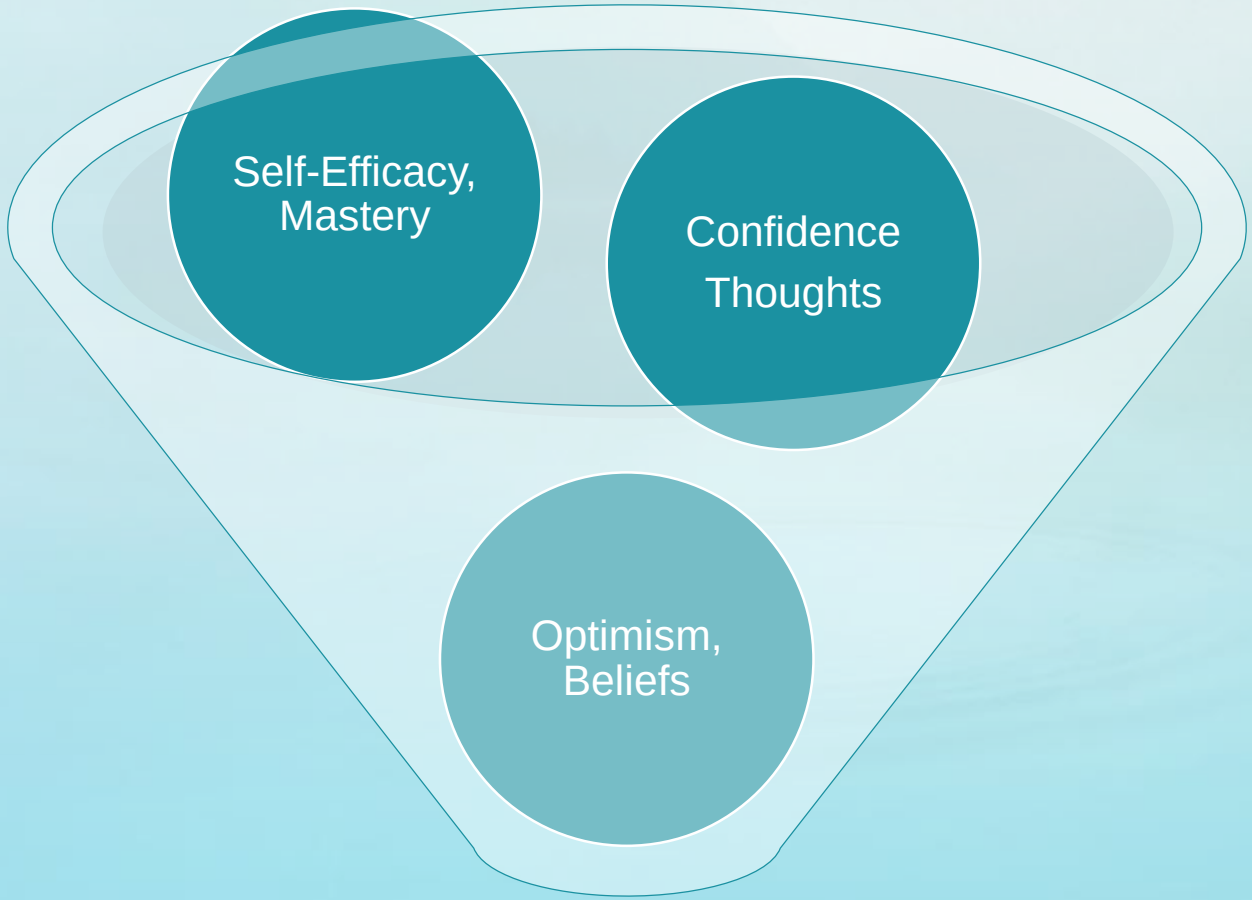
No pessimist ever discovered the secret of the stars or sailed an uncharted land.

Reach for the Moon—
If you miss your mark, you will land amongst the stars



Resilience

Neurological Foundations



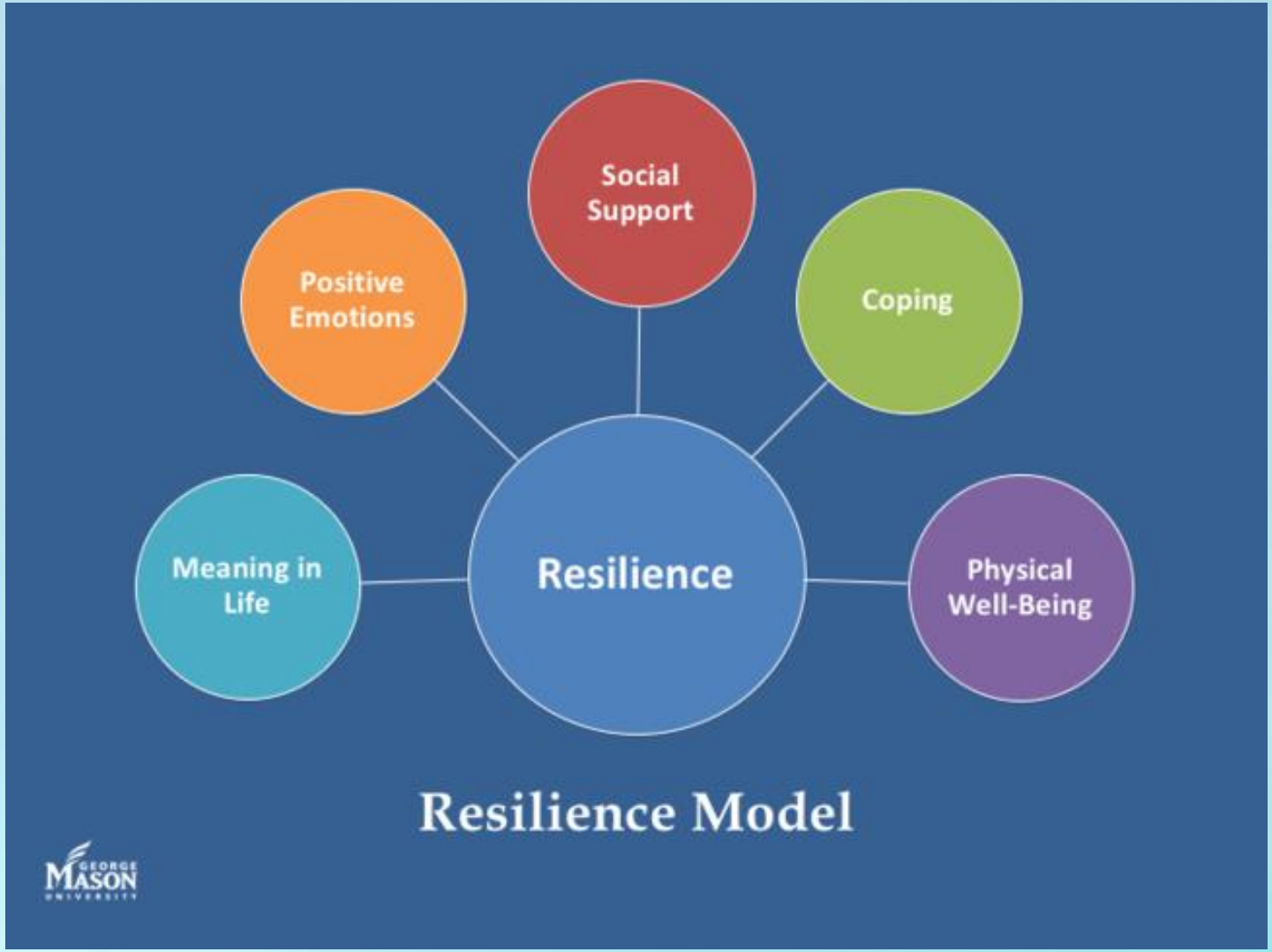
Self-Esteem

re·sil·ience

/rəˈzilyəns/

noun

1. the capacity to recover quickly from difficulties; toughness.
2. the ability of a substance or object to spring back into shape; elasticity.



Resilience

- Resilience is a successful adaptation to significant debilitating adversity or life stress. Coping is a similar idea, but resilience is a broader concept
- A stable personality trait characterized by ability to: overcome, steer through and bounce back from adversity
- Characterized by:
  - Self acceptance
  - Positive Affect
  - Optimism
  - Curiosity
  - Use of humor
  - Use of relaxation techniques
  - Optimistic thinking in the face of adversity
- Military – resilience training
- Victor Frankle (Nazi concentration camps) – once gave up their resilience, they died quickly

7 C’s of Resilience

- Competence
- Confidence
- Connection
- Character ***
- Contribution
- Coping ***
- Control

APA Definition of Resilience

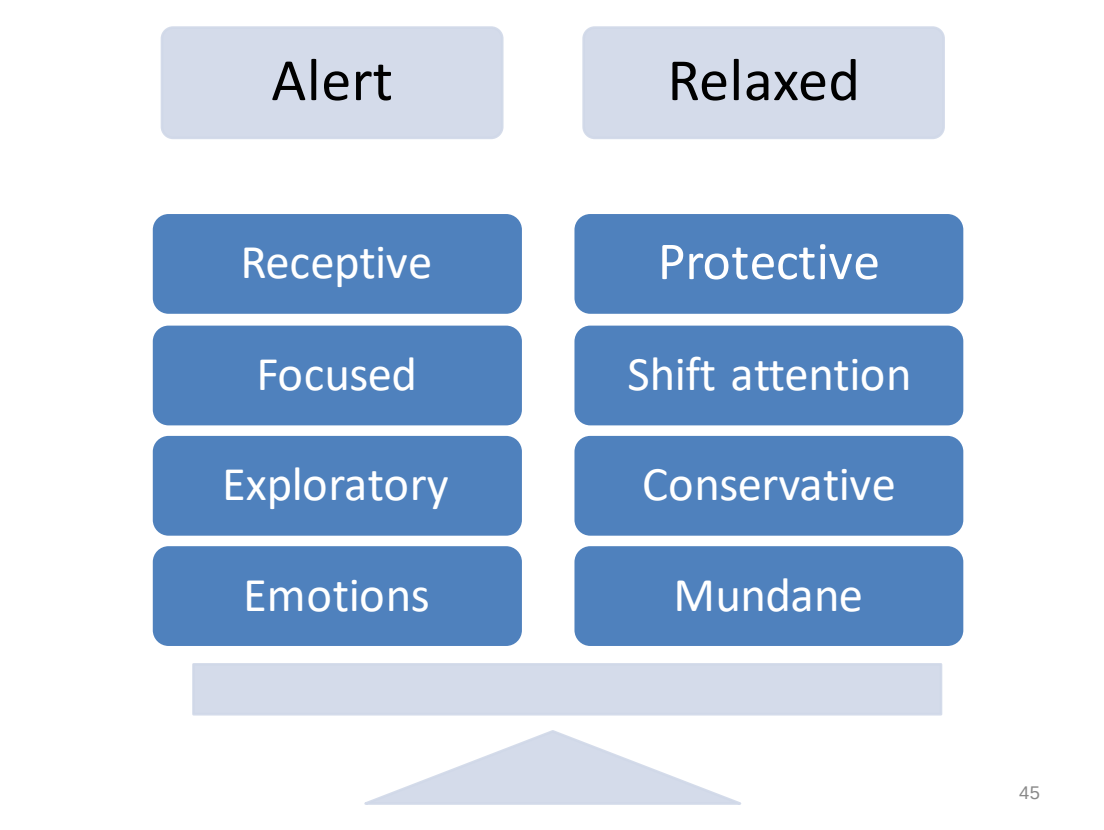
- Resilience is the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to external and internal demands.
- A number of factors contribute to how well people adapt to adversities, including the ways in which individuals view and engage with the world, the availability and quality of social resources, and specific coping strategies.
- Psychological research demonstrates that the resources and skills associated with resilience can be cultivated and practiced.

Factors associated with resilience:

- The ability to make realistic plans and take steps to carry them out.
- A positive view of yourself and confidence in your strengths and abilities.
- Skills in communication and problem solving.
- The capacity to manage strong feelings and impulses.

- *Many studies show that the primary factor in resilience is having caring and supportive relationships within and outside the family. Relationships that create love and trust, provide role models and offer encouragement and reassurance help bolster a person's resilience.*

We need a balance of Stability and Mobility



Resilience and Nature

Research

- Resilience to psychological stress is defined as adaption to challenging life experiences and not the absence of adverse life events. Determinants of resilience include personality traits, genetic/epigenetic modifications of genes involved in the stress response, cognitive and behavioral flexibility, secure attachment with a caregiver, social and community support systems, nutrition and exercise, and alignment of circadian rhythm to the natural light/dark cycle. Therefore, resilience is a dynamic and flexible process that continually evolves by the intersection of different domains in human's life; biological, social, and psychological.
- building resilience requires an intricate network of positive experiences and a healthy lifestyle that contribute to a balanced mind-body connection.
- by immersing ourselves in the natural world, we can reduce stress, enhance emotional well-being, gain perspective, and develop adaptive skills. Nature reminds us of our place in the larger tapestry of life and provides inspiration, solace, and support during difficult time

Natural Environment's Benefits Children's:

- Confidence
- Social interaction
- Cognitive development
- Academic achievement
- Emotional Well-Being

Connection and Awe – Our Mission and Purpose

Flow or the “Just-Right Challenge”

(Csikszentmihalyi, 1997)

- Concentration requires more effort when it goes against the grain of emotions and motivation.
- Unless one learns to concentrate, and is able to invest the effort, thoughts will scatter.
- Conflicting desires, intentions and thoughts disturb our peace and consciousness. Important to get clarity.

In FLOW activities what we feel, wish and think are in harmony.

There is a sense of effortless action and there is no space in consciousness for distracting thoughts.

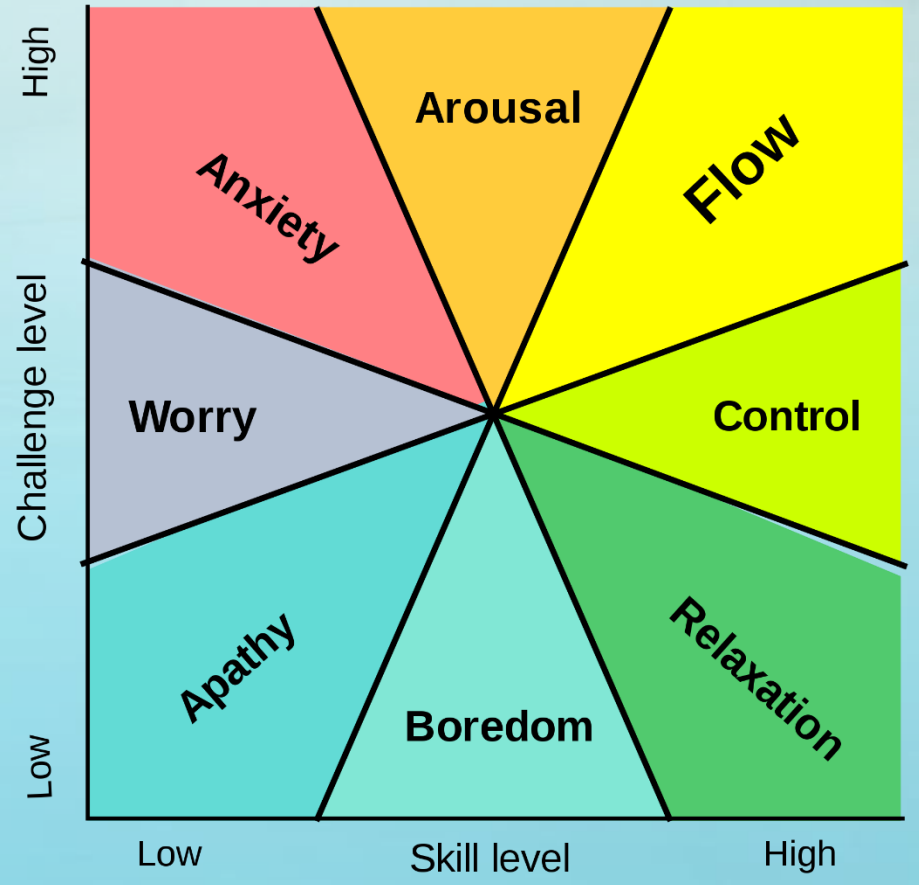
Csikszentmihalyi's "Flow"

- "The best moments in our lives are not the passive, receptive, relaxing times . . . The best moments usually occur if a person's body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile".

~ Csikszentmihalyi, 1990, "Flow: The Psychology of Optimal Experience"

Flow requires a balance of skill and challenge levels

Flow is “a state in which people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it”



Csikszentmihalyi's 8 characteristics of flow:

1. Complete concentration on the task
2. Clarity of goals and reward in mind and immediate feedback
3. Transformation of time (speeding up/slowing down)
4. The experience is *intrinsically* rewarding
5. Effortlessness and ease
6. There is a balance between challenge and skills
7. Actions and awareness are merged, losing self-conscious rumination
8. There is a feeling of control over the task

Resilience and Nature

A Look at Neurophysiology

Importance of Joy

We shall define joy and happiness as related, but very different terms:

Happiness = transient good feelings, such as a bowl of your favorite ice cream or a leisure vacation to your favorite fun-filled destination.

Joy = more sustaining feelings of wellness, peace, contentment and balance, such as a savory healthy meal, meaningful/purposeful activities, positive thoughts, gratitude and quiet time spent in self-reflection and compassion.

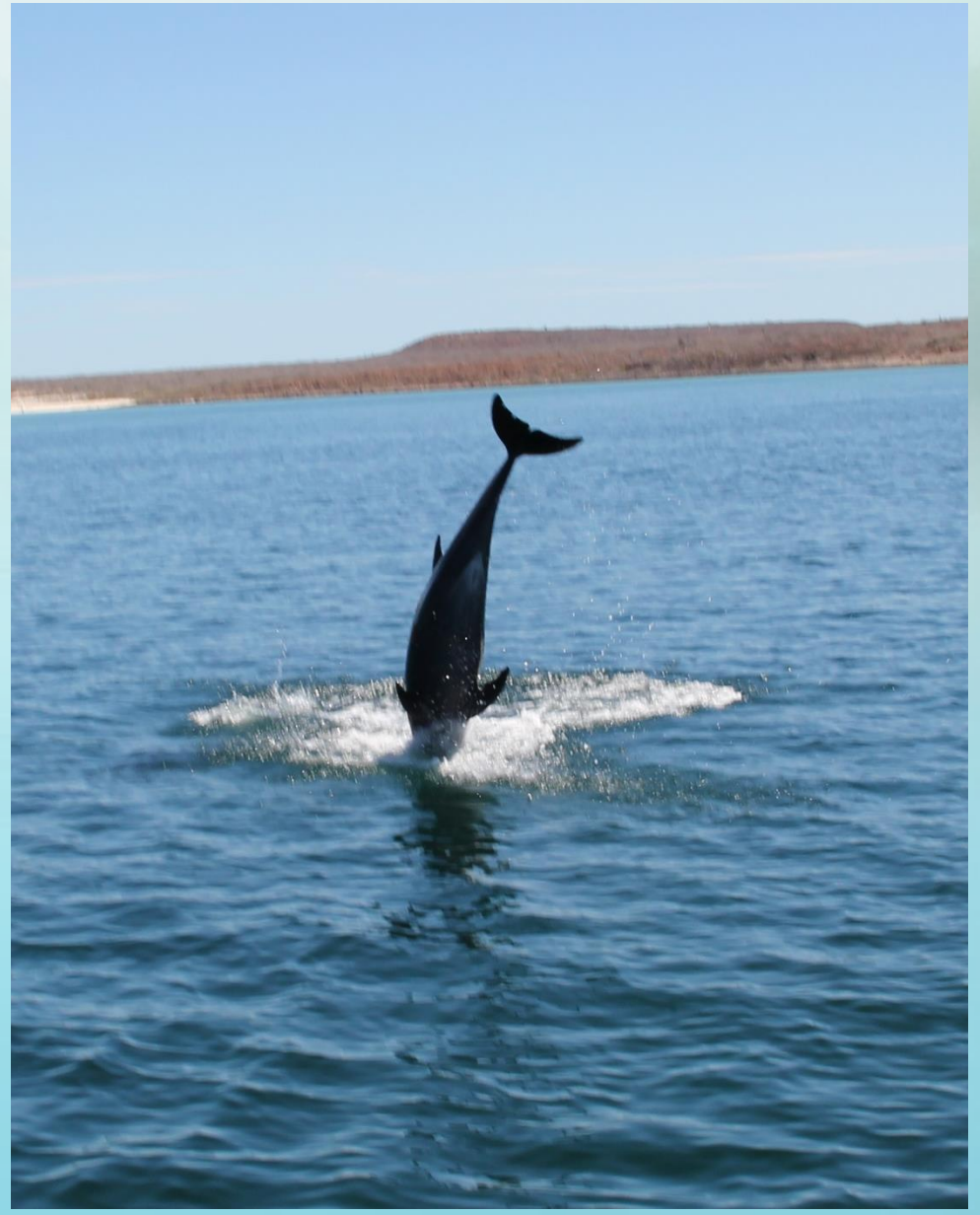
Joy is primarily a response from what we *choose* to do and think. It is a feeling state that can only be achieved through *healthy action*.

Eudaimonia

The Greek word for happiness or welfare, often translated as “human flourishing”.

Eudaimonia has 6 aspects of positive functioning: *(C.D. Ryff, 2013*

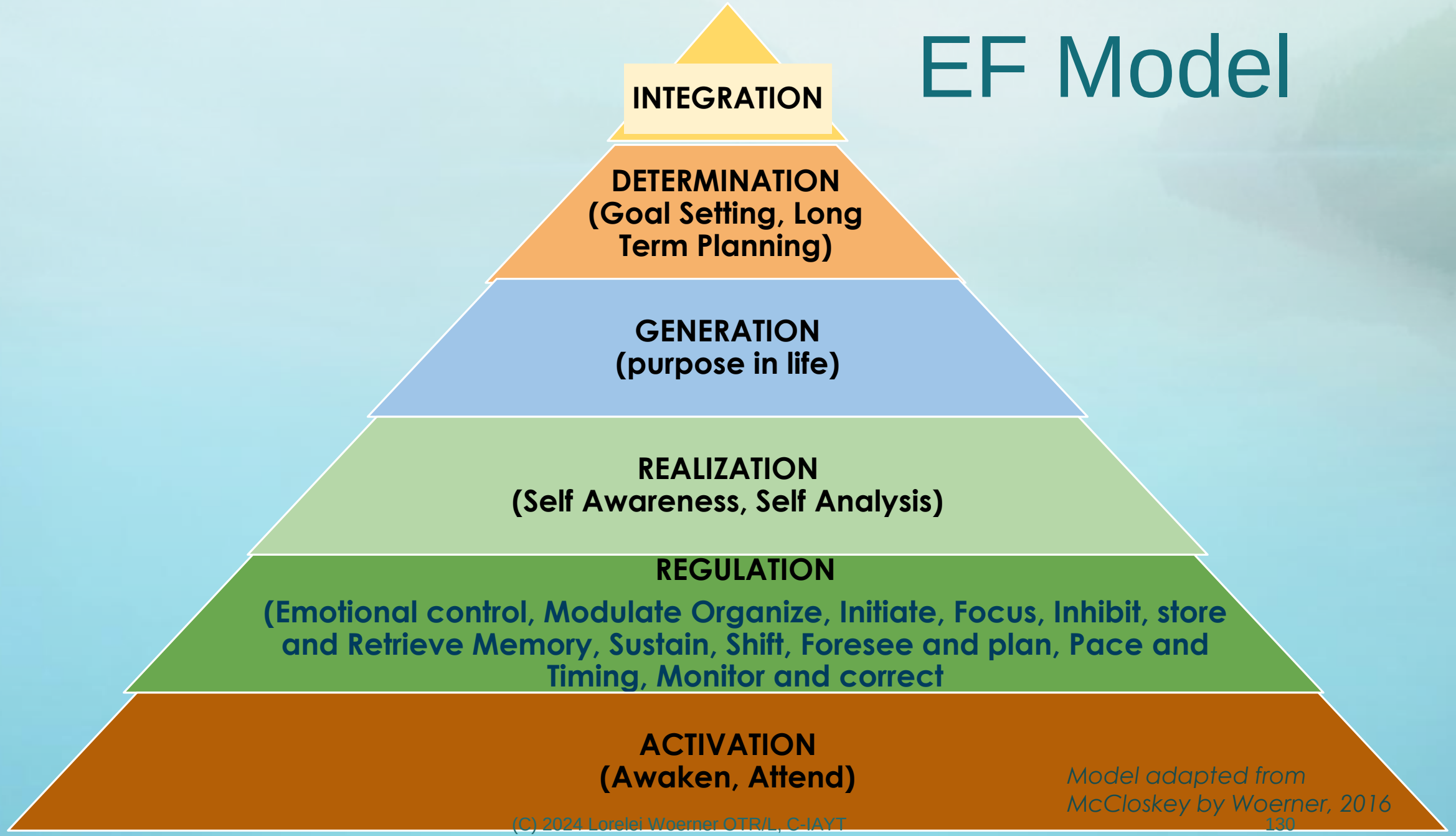
1. Autonomy
2. Personal Growth
3. Self-Acceptance
4. Purpose in life
5. Environmental mastery
6. Positive relations with others



Benefits of *purpose* in life:

- Organizes and stimulates goals (directs daily decisions and use of resources)
- Manages behaviors
- Decreases allostatic load (“wear and tear” on your body)
- Enhances cognitive function
- Provides a sense of meaning
- Offers direction
- Is woven into a person’s identity and behavior
- Is a central and predominant theme in a person’s life
- Provides a protective effect on mortality and risk for disability in aging
- It is key to psychological well-being, flourishing and Eudaimonia

EF Model



Model adapted from McCloskey by Woerner, 2016

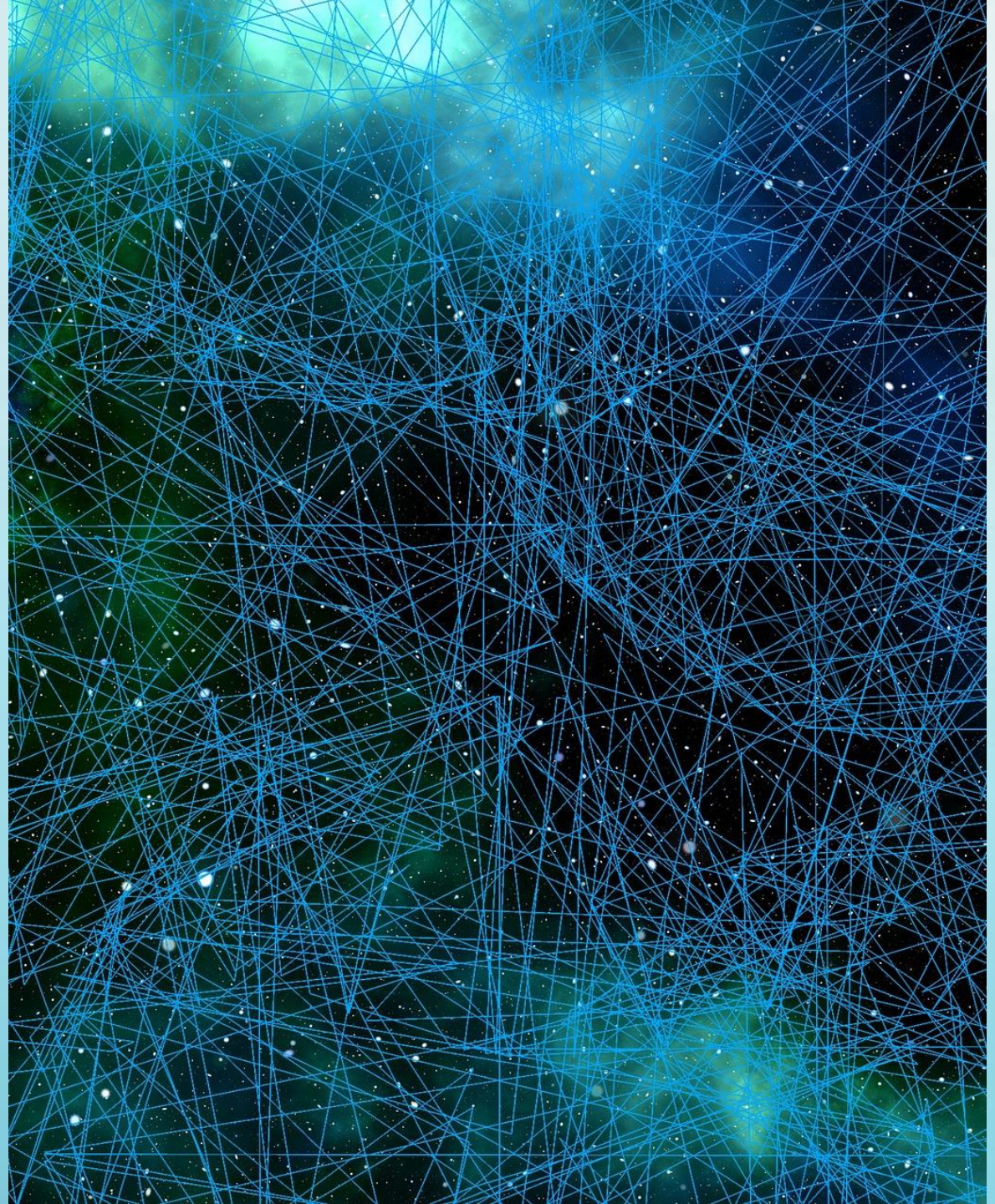
Joy comes from using your potential

Maria Branyas Morea

Died August 2024, at age 117 year, as world's oldest living person

She believed her longevity stemmed from "order, tranquility, good connection with family and friends, *contact with nature*, emotional stability, no worries, no regrets, lots of positivity and staying away from toxic people".

We can't control the wind, but we can adjust our sails



Exploring the Hypotheses of Why Nature Supports These Results

The Biophilia Hypothesis

also suggests that since our ancestors evolved in wild settings and relied on the environment for survival, therefore we have an innate drive to connect with nature.

Theories on Nature's *Restorative* Effects

- Stress Reduction Theory (SRT; Ulrich et al., 1991) -- suggests that exposure to nature triggers a physiological response that lowers stress levels, blood pressure and heart rate, and improves sleep.
- Attention Restoration Theory (ART; Kaplan, 1995) -- suggests effects are via restoration from directed attention fatigue, enabling effective cognitive performance. Nature replenishes one's mental resources, restoring the ability to concentrate and pay attention.
- Perceptual Fluency Account (PFA; Joye & van den Berg, 2011) – purports that fractals in natural objects render their natural elements highly like each other, thus enabling humans to easily predict other components in the scene and to fluently process the whole natural object with minimal cognitive resources (i.e., directed attention).

- Self-Determination Theory (SDT; Deci & Ryan, 1985; 2000; Ryan & Deci, 2017) -- holds that humans strive to behave in a self-motivated and self-determined way. Three basic needs are critical for achieving this goal:
  - 1. Autonomy (i.e., feeling volitional in making one's own decisions and actions)
  - 2. Competence (i.e., feeling capable of accomplishing desired outcomes)
  - 3. Relatedness (i.e., feeling connected to and accepted by others).

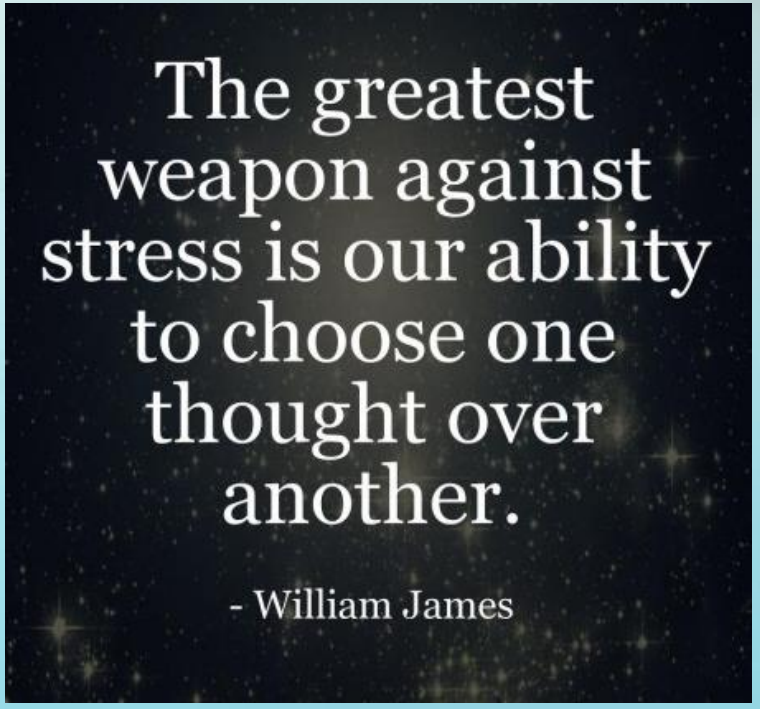
- AUTONOMY
  - Escape from daily routines -- Fewer demands and constraints
  - Freedom of self-expression – reduction in social judgement
  - More likely to engage in challenging situations in nature
- COMPETENCE
  - Stronger sense of control – reducd demands and social expectations
  - Research has shown that engaging with nature can help people gain more control over their lives, improve their sense of self-worth, capability and vitality
  - Feel more capable of maintaining control over and coping with life events (Fabio,
  - connection to nature evaluate their self-image at a higher level (Swami, Barron, Weis, & Furnham, 2016)
- RELATEDNESS
  - Connecting with other living things
  - Help regain a sense of belonging

- Empowering – learning new skills (fishing, birding, building, identifying, growing, motor skills….)
- Promotes prosocial behaviors (cooperating, sharing, helping, compassion, caring for others and nature)
- Promotes creativity and imagination (thinking more freely without constraints or directives)

Treatment Strategies

The brain is wired for change

- Thinking patterns actually change neurochemical and molecular charges in the neurons
- Therefore we can use the *Mind* to alter the structure of the *Brain* -- and body



The brain is wired for change

- Change involves learning and all learning generates change in the brain
- Thinking patterns actually change neurochemical and molecular charges in the neurons
- The complex network of neurons manages the flow of information that shape behaviors, and ultimately lifestyle choices.
- *Thoughts spark emotion-driven action* – a thought or drive to act or not

Therefore, you can CHOOSE to change your mind

by choosing another way of thinking.

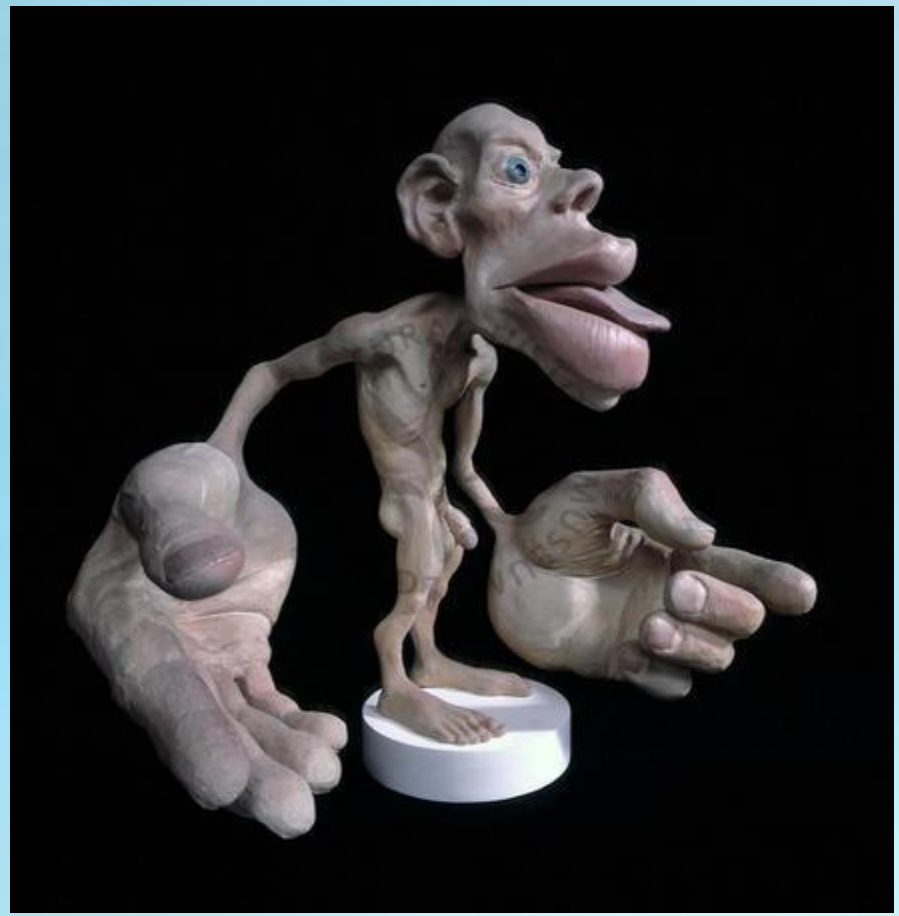
- Negative thought patterns create a self-fulfilling nature, limiting our potential.
- With negative view and worry, it's as if we are praying for or visualizing what we don't want.
- Positive affirmations bring us closer to realizing our full potential.
- With mindful awareness, positive visualization, focus and affirmative conscious effort, we can choose to establish new patterns in our lives.

You can use your mind to change your brain – and your body!

Pruning

- Development of **Grey matter** is strongest in preschool and adolescence. If brain kept growing, it would be enormous.
- Pruning allows for a consolidation of skills. Connections not needed (or used) fall away.
- Brain growth in adolescence occurs primarily in frontal lobes, due to increase in demand for EF.
- NIMH suggests a “use it or lose it” process may occur during adolescence. As such, practice of EF skills in adolescence in particular is significantly important to the development of the brain structures.

Sensory Homunculus



Motor Homunculus

How Do We Access Nature?

- Spending time outdoors
- Plants, fish, pets indoors
- Opening windows and shades, allowing natural light in
- Paying attention to elements of nature out the window
- Reflecting and/or studying nature videos, images or art
- Listening to nature sounds
- Essential oils from nature, flower essences, rose water spray

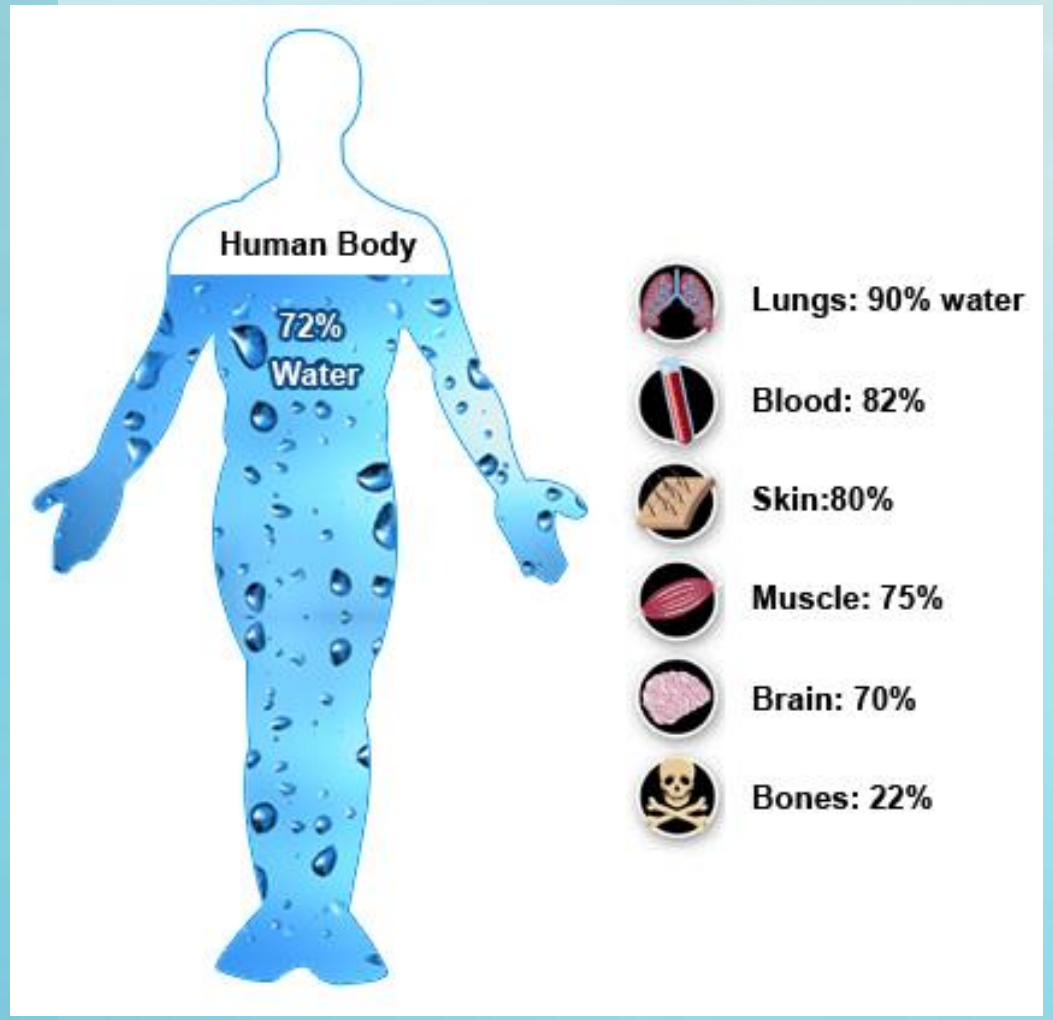
Benefits of this under-utilized resource

- Often accessible for free
- Relatively low cost to bring into the school or clinic-setting
- Increased understanding of the natural world
- Reduces “nature deficit disorder”

Touch

Scents

Sounds


Human Body
72%
Water
Lungs: 90% water
Blood: 82%
Skin:80%
Muscle: 75%
Brain: 70%
Bones: 22%


Compassion
Thank you
Wisdom
Heavy Metal Music
I will kill you
You fool

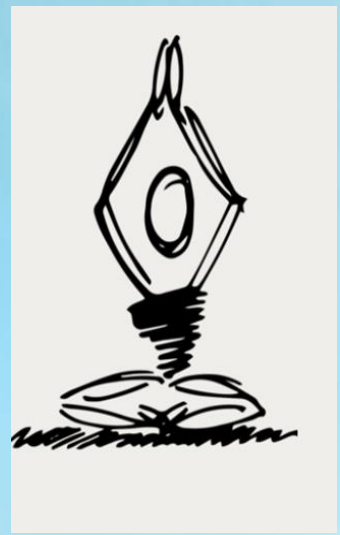
Visuals

Motor Skills, Proprioceptive, Vestibular

Contemplation, Focus

Balancing the Nervous System

Calming

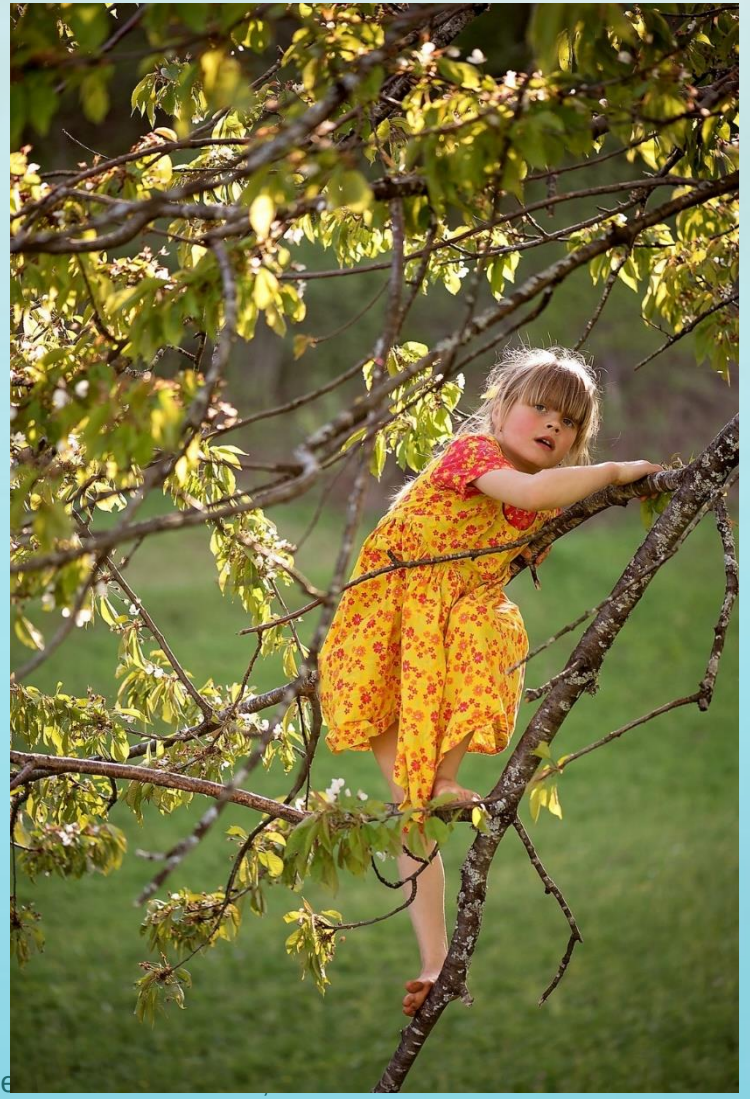


1. Focus on Exhale
2. Forward Fold + Exhale

Energizing

1. Focus on Inhale
2. Backbend + Inhale

Anticipation and Planning



Relationship, Connection

Mindfulness

Building Confidence and Self-Esteem

- Setting and achieving realistic goals
- Learning and empowering self with knowledge
- Focus on your strengths and successes, and less comparisons
- Do things that bring joy
- Reframing feelings of learned helplessness, anxiety, guilt, incompetence

Visualization

"In a federally funded projects in both Bell High School and Main Street Elementary School, both in Los Angeles, students scored significantly higher on standardized tests over a 3 year period relative to control groups by using relaxation and imagery exercises. As they visualized themselves as relaxed, successful students, they learned more quickly and retained more information."

"Spinning Inward" by Maureen Murdock

Pediatric “Occupation”?

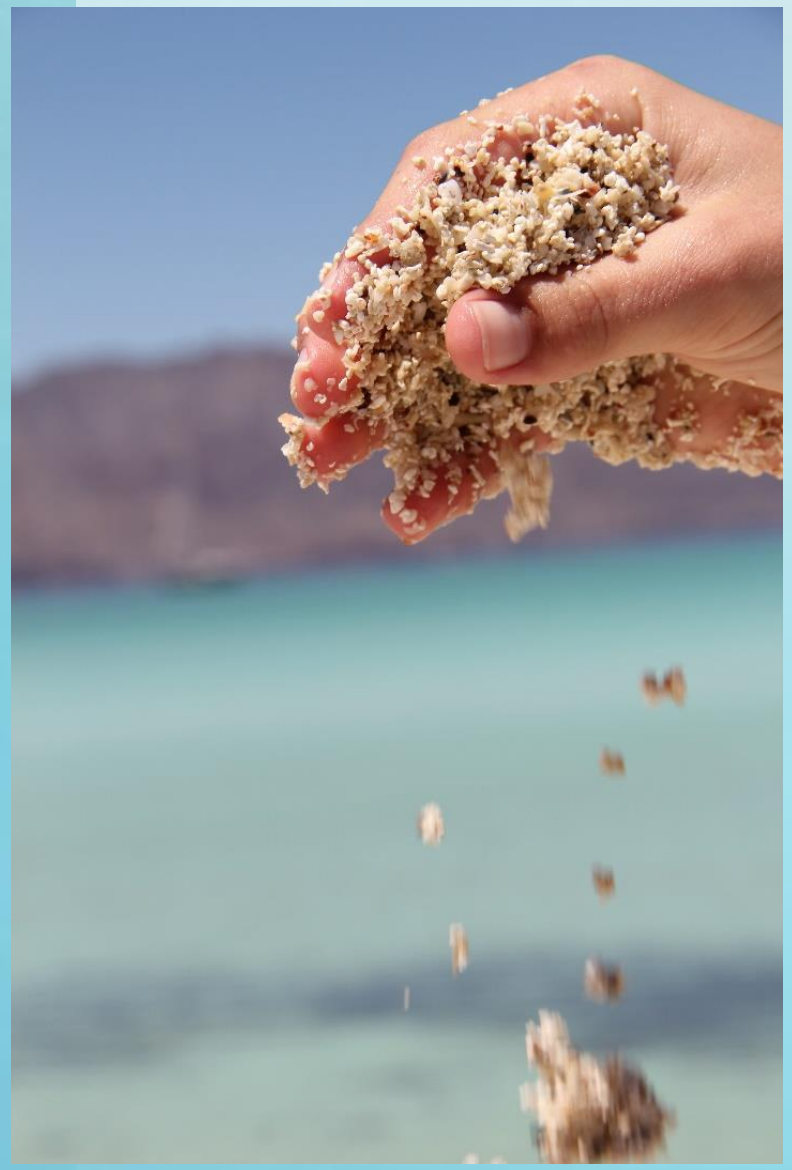
- Attention of the mind
- Self-awareness
- Faith
- Self-empowerment
- Relationship is key

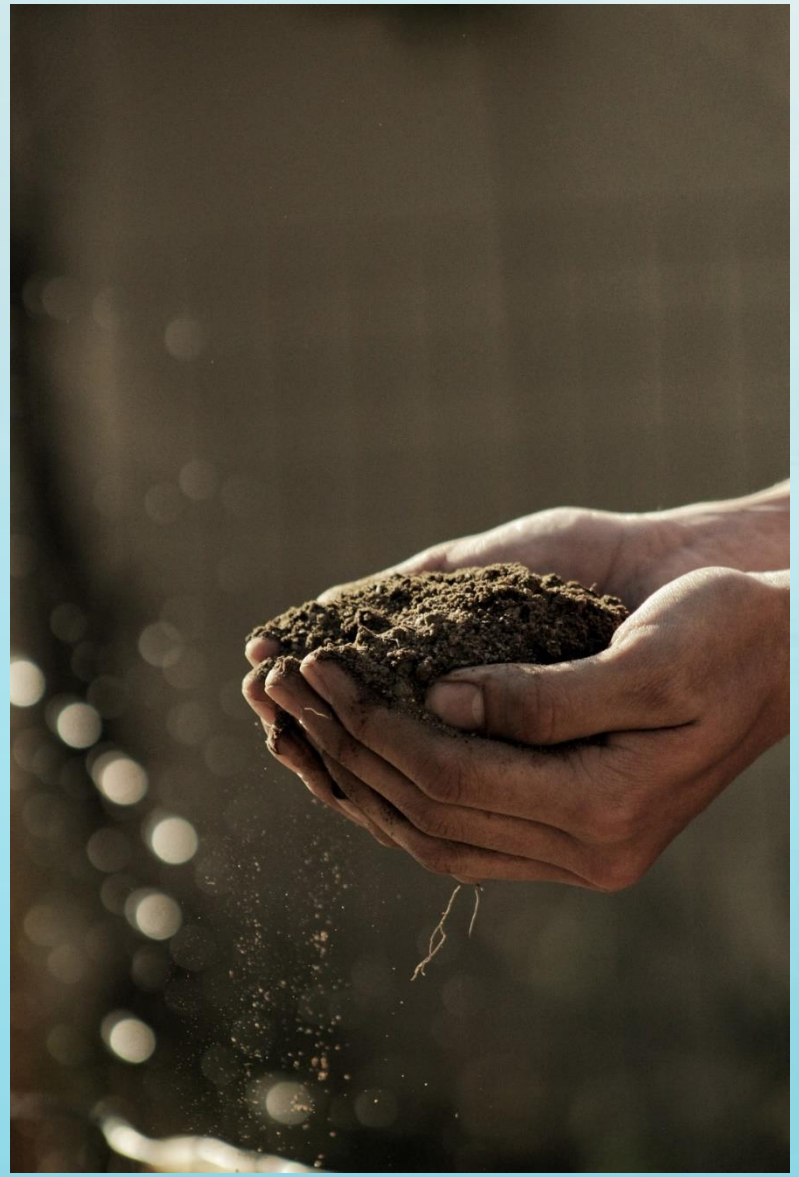
Grounding

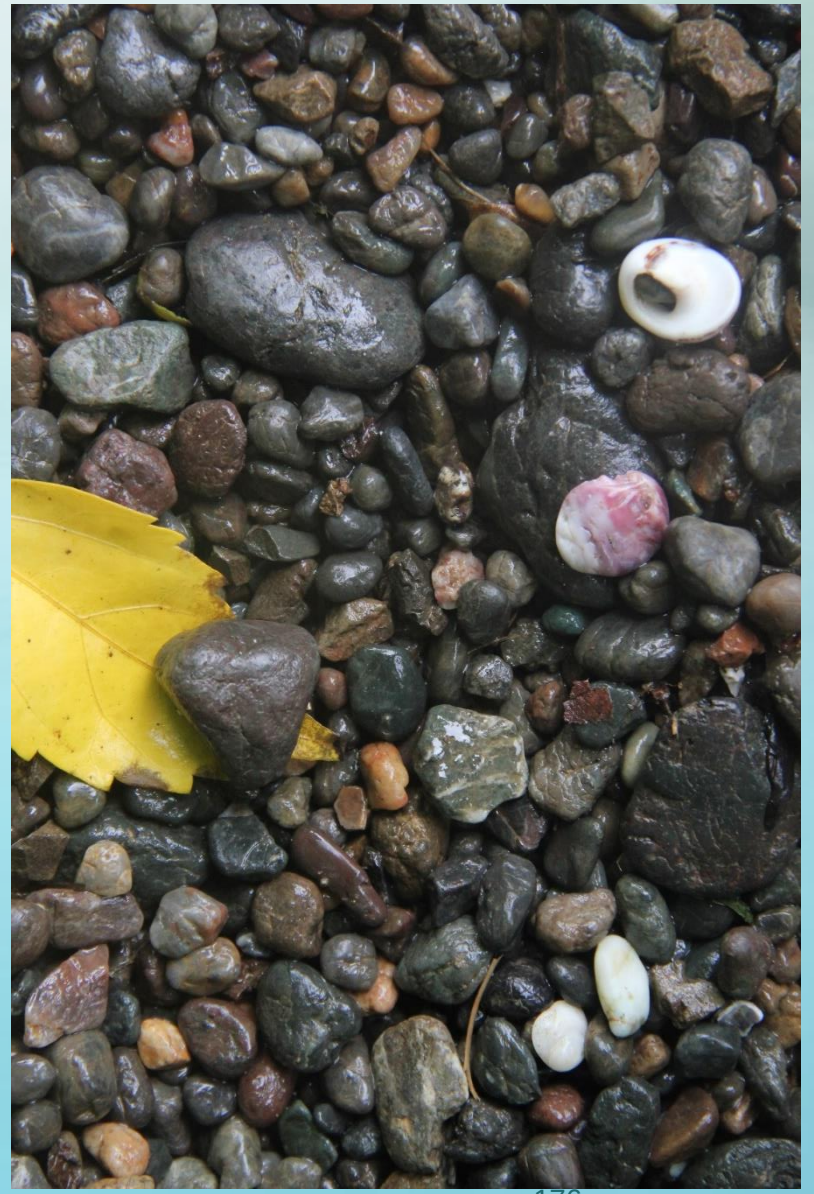
- Direct physical contact of the human body with the surface of the earth
- One study examined the effects of 2 hours of grounding on the electrical charge on red blood cells (RBCs) and the effects on the extent of RBC clumping. They found that grounding increases the surface charge on RBCs and reduces blood viscosity and clumping. They state “Grounding appears to be one of the simplest and yet most profound interventions for helping reduce cardiovascular risk and cardiovascular events
  – *(Gaetan et al, 2013)*

Indoor, Urban and Marginalized Settings

Look at images








no-glue
LEAF
LUMINARIES


dried
mealworms

Sensory Sensitivities?

Grading and Modifying

- Images to In Vivo
- Length of time
- Unplug – phones off to enhance mindfulness and being in the present
- With or without friends
- or vary the medium (video vs. actual)
- or sensory channel (sounds vs. images) of exposure to nature.
- grading for the just-right challenge, modifications, adaptations, scaffolding and facilitating,
- Natural Products – cotton, bamboo

WHO ARE YOU? (Meditation)

Walk across a meadow to a tree
See someone who is important to you.
They ask “who are you?’
“What do you want to do in life?”
“What do you need to do to get there?”
Walk back across the meadow and into the room

Albert Einstein, was considered a “dull student”. One day, as he lay on his back playfully watching the sunlight as it came through his eyelashes, he wondered what it would be like to travel down a sunbeam. As he let his mind wander through that image, he had a sudden insight into exactly what it would be like. This creative insight enabled him to piece together the theory of relativity.

He often said that the most important aspect of intelligence is the ability to use imagery with the

"You are not a drop in the ocean, you are the entire ocean in a drop.“ ~ Rumi

Connections >>>>>>>>>>>>>>>>

- **Facebook**: Integrative Wellness Therapy
- **Instagram**: Integrative Wellness Therapy
- **Pinterest**: Integrative Wellness Therapy
- **LinkedIn**: Lorelei Woerner-Eisner, OTR/L, C-IAYT
- **Pixabay**: loloveslife
- **Website**: Integrative Wellness Therapy
- **Email**: Lorelei@integrativewellnesstherapy.com
- **Phone**: 310-991-9495

➢Thanks: OTAC, Pixabay

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RECOMMENDED READING

- “Your Brain On Nature**:** The Science of Nature's Influence on Your Health, Happiness and Vitality”, Eva M. Selhub MD, Alan C. Logan ND
- “Building Resilience in Children and Teens: Giving Roots and Wings”, Kenneth R. Ginsburg, MD, MS Ed, FAAP
- The Biophilia Hypothesis”, Edward O. Wilson (1984)
- “Emotion and Motivation”, Brian Parkinson and Andrew M. Coleman
- “Last Child in the Woods” by Richard Louv
- “Blue Mind: The Surprising Science That Shows How Being Near, In, On, or Under Water Can Make You Happier, Healthier, More Connected, and Better at What You Do” by Wallace J. Nichols