

A photograph of four people riding horses on a trail. From left to right: a man in a brown jacket and cap on a white horse; a woman in a yellow jacket and wide-brimmed hat on a brown horse; a woman in a black jacket and cap on a white horse; and a man in a blue hoodie and wide-brimmed hat on a brown horse. The background features rugged mountains and evergreen trees under a clear blue sky.

Maximize Outcomes by Cooperating with Riders' Brains

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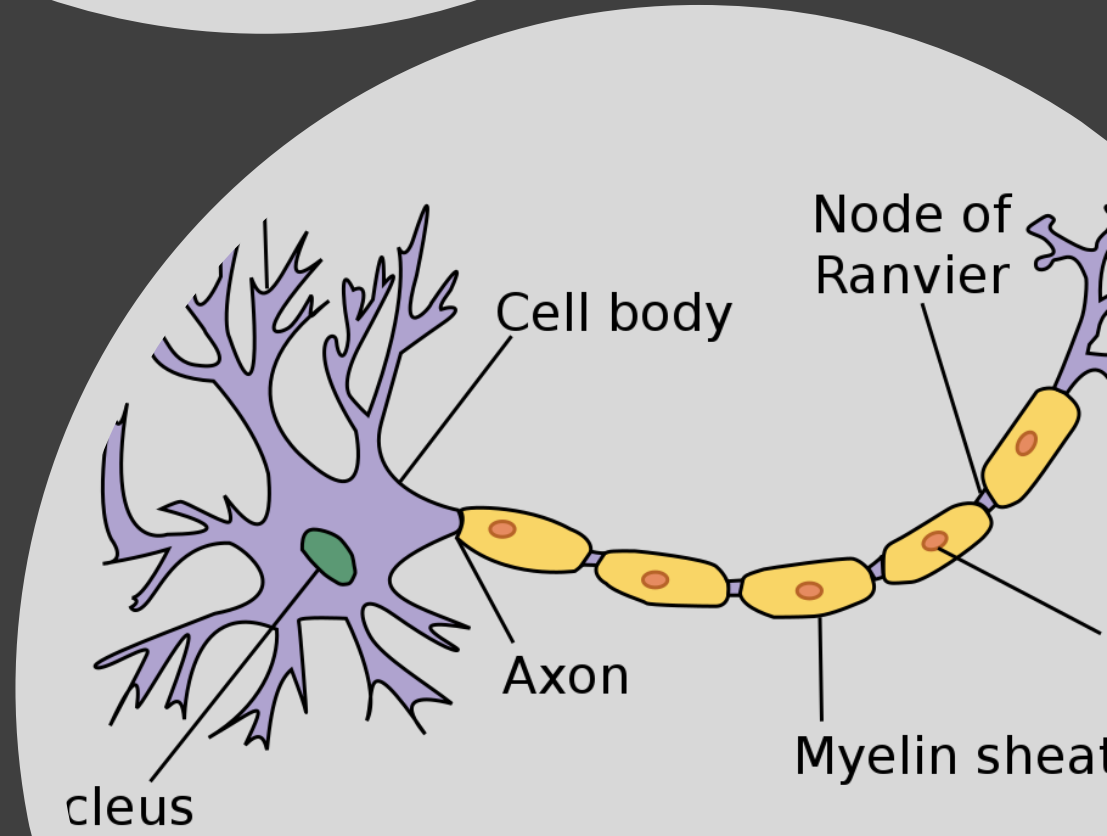


Understanding the Brain

- The brain is about 75% water.
- The brain weighs about 3 pounds.
- The brain has more cells (called neurons) than it needs when we are born.
- Brain information travels up to an impressive 268 miles per hour.
- Your brain's storage capacity is considered virtually unlimited.
- Sixty percent of the human brain is made of fat.
- Your brain isn't fully formed until age 25.

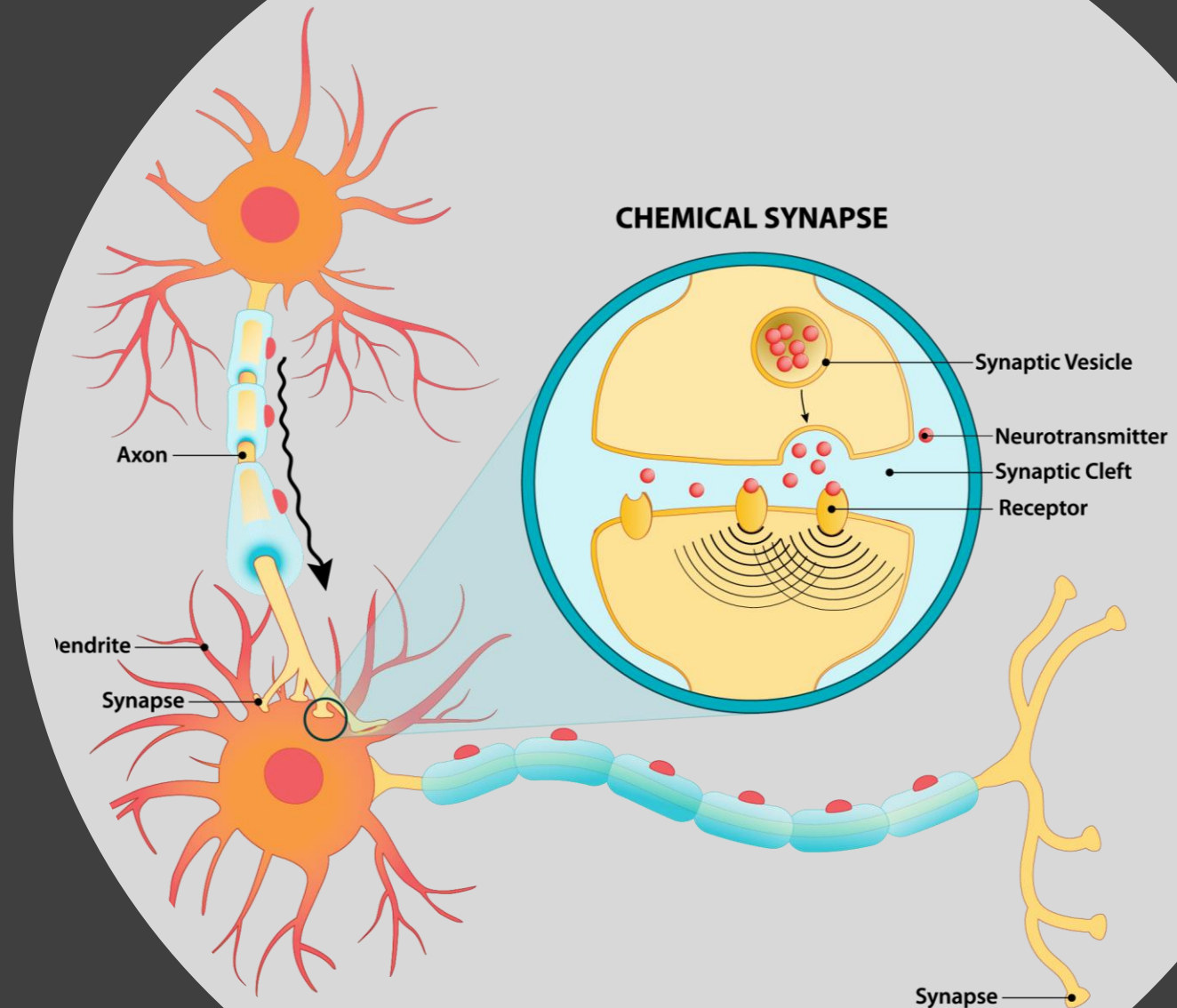
Brain Systems

- Building blocks of the brain are cells called neurons.
- Neurons communicate with each other:
 - Chemicals called neurotransmitters
 - Electricity
- Neurons need an insulator to keep from shorting out. It is called myelin.

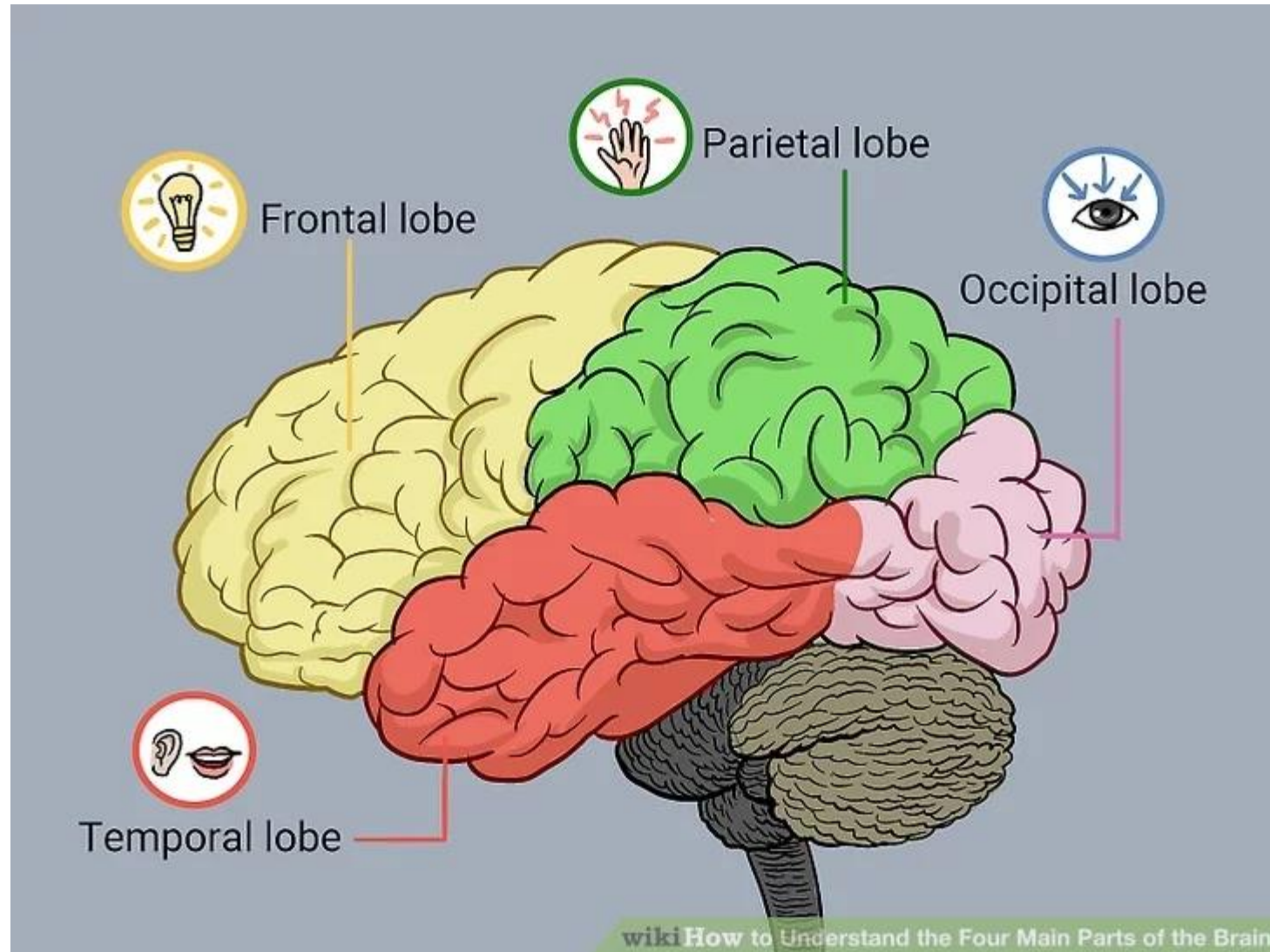


AXON COMMUNICATION

- Neurochemicals are released from one neuron into the space between neurons called a synapse.
- They are received by the receptor on the next neuron.



Different Parts of the Brain do Different Things



Maximize your opportunity for effectiveness

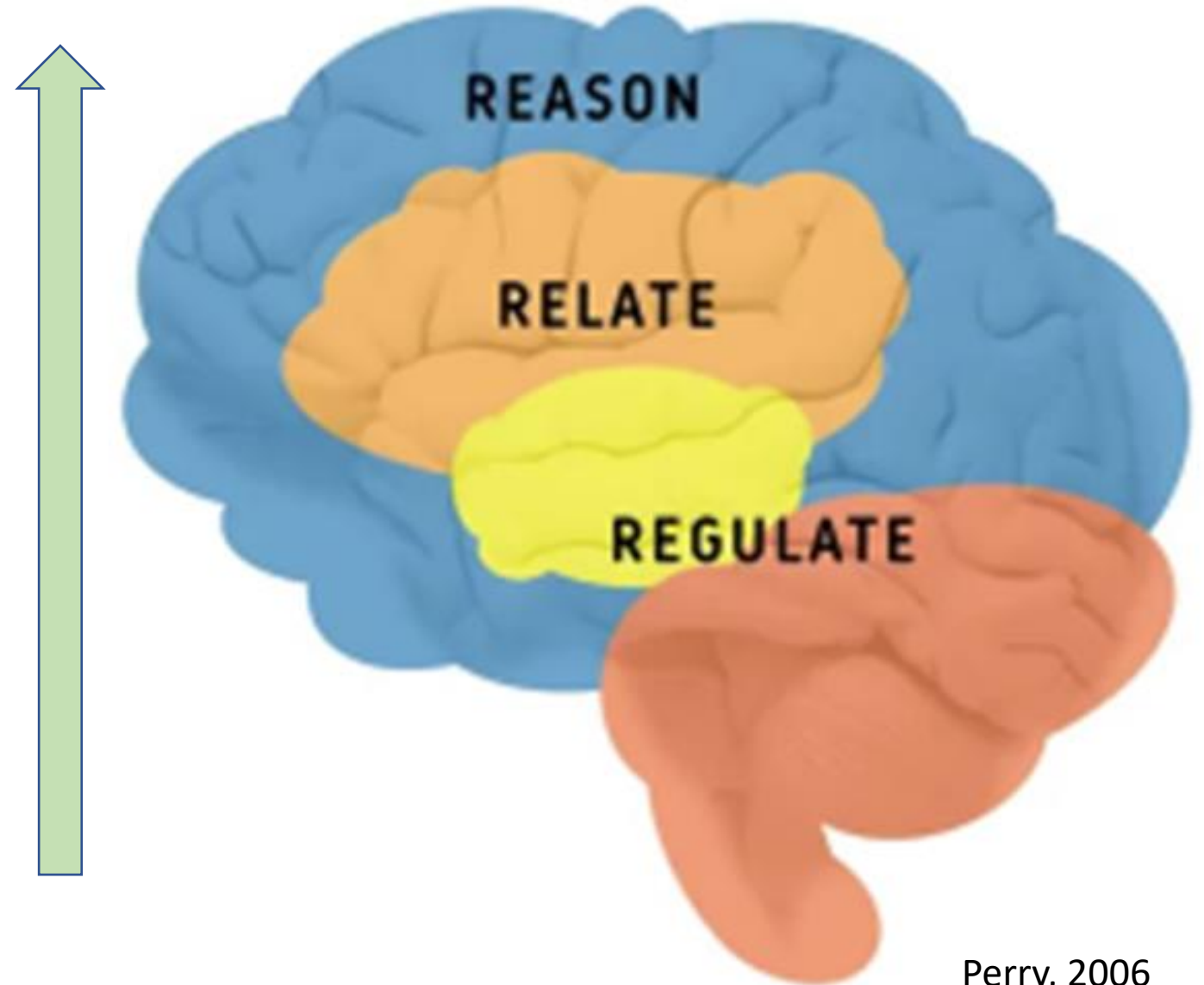
The
POINT

Cooperating with
how the brain
functions will
maximize your time,
energy, resources
and volunteers!

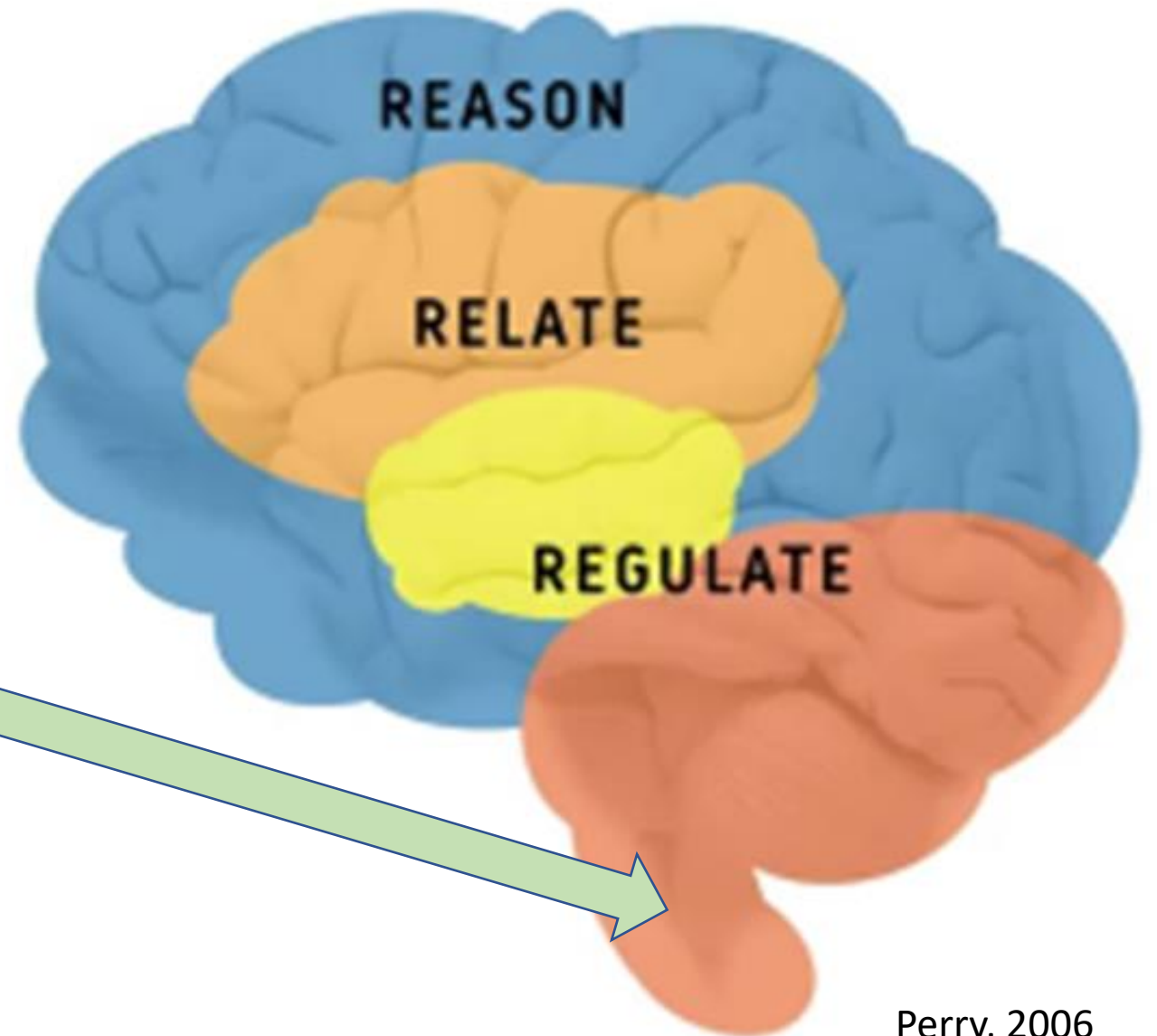
The Brain Works “Bottom Up”

The “lower” parts of the brain have to work before the upper parts of the brain can work.

Neurosequential Model



Neurosequential Model



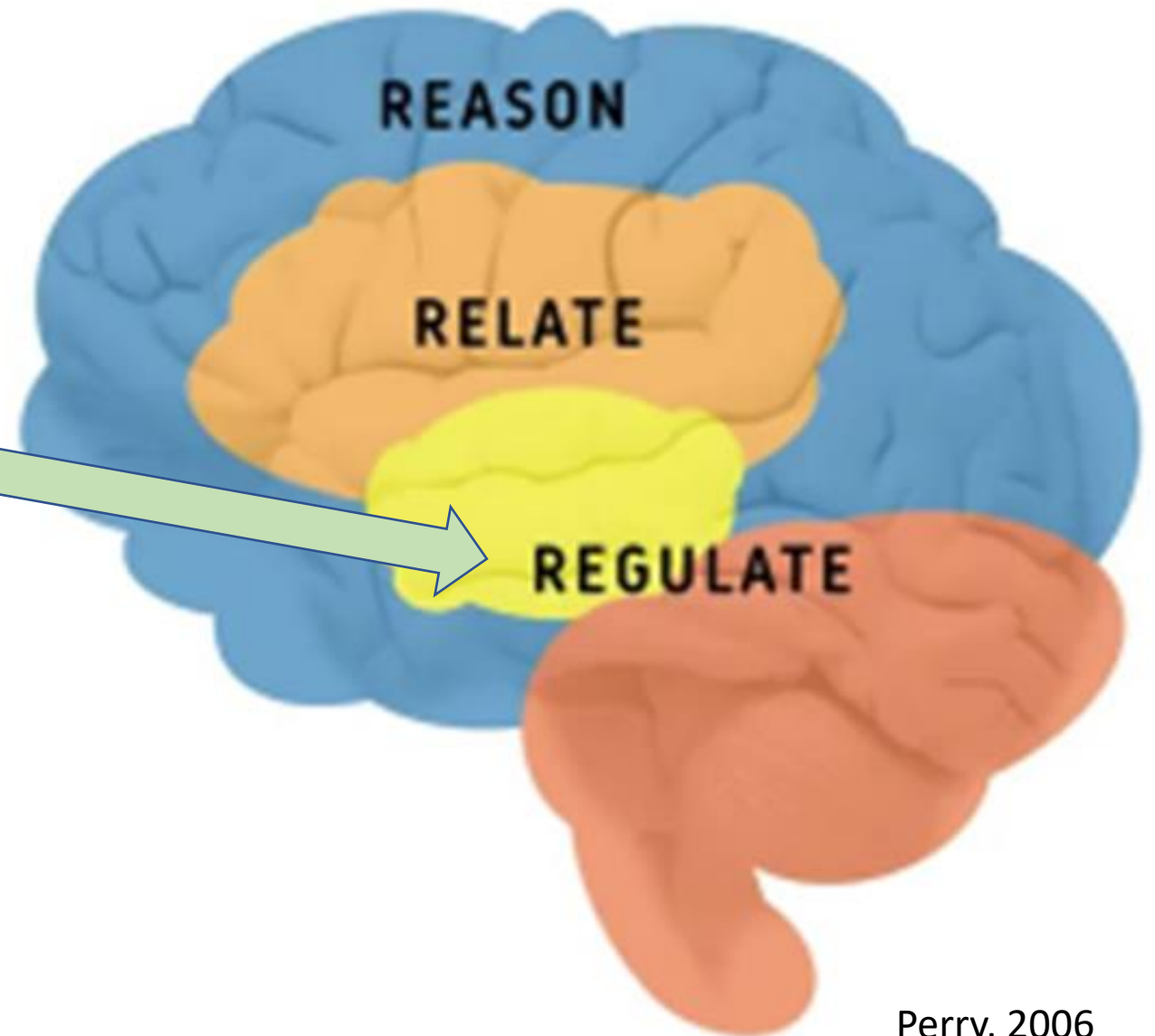
Brain Stem:
Automatic
functions of
the body

If this isn't working, we have big
problems!

Neurosequential Model

Limbic Brain: Emotional Regulation

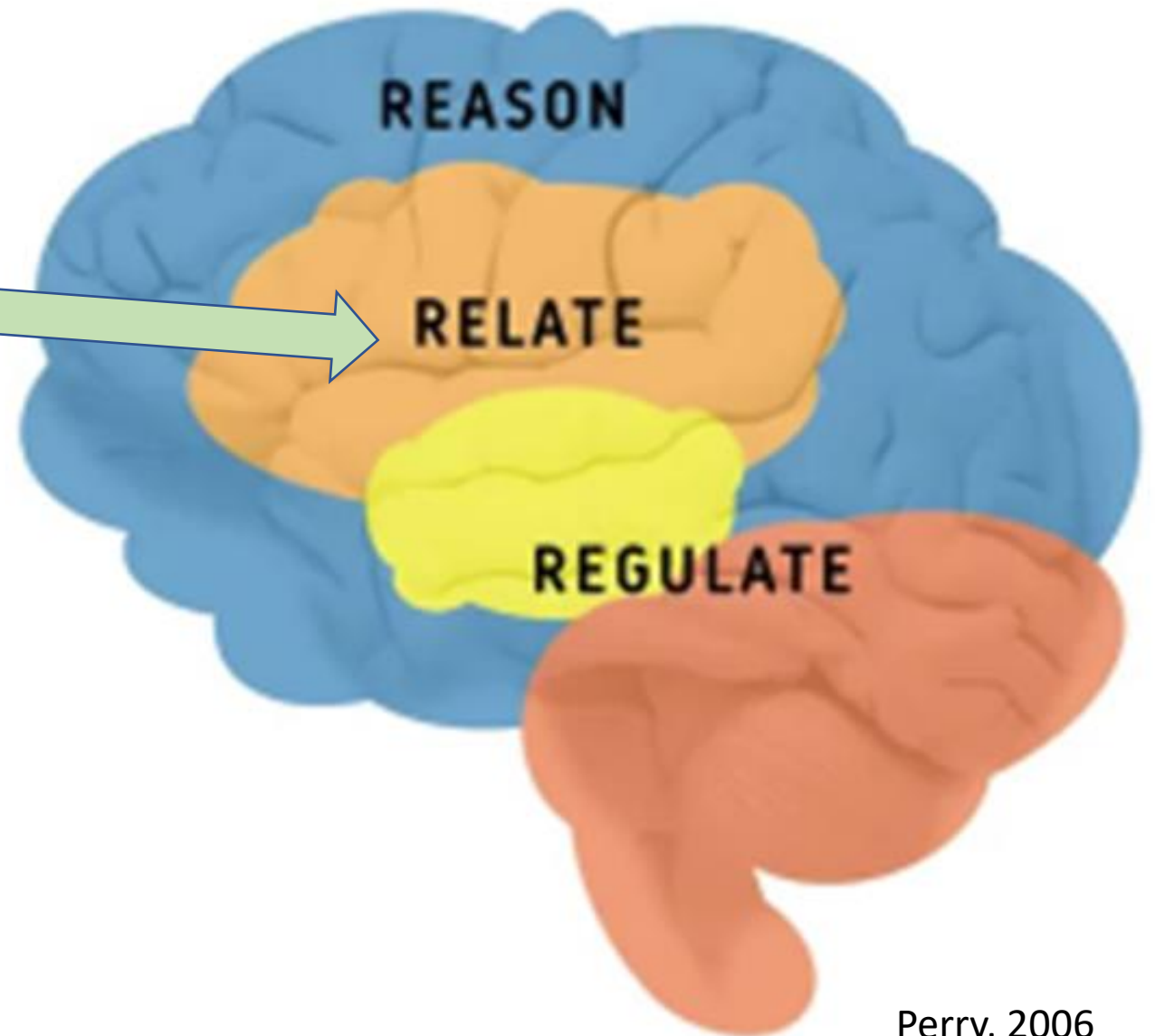
This part of the brain that handles
behavioral and emotional
responses.



Neurosequential Model

Limbic Brain: Relationship

This part of the brain that desires
and allows us to have emotional
connection with others.

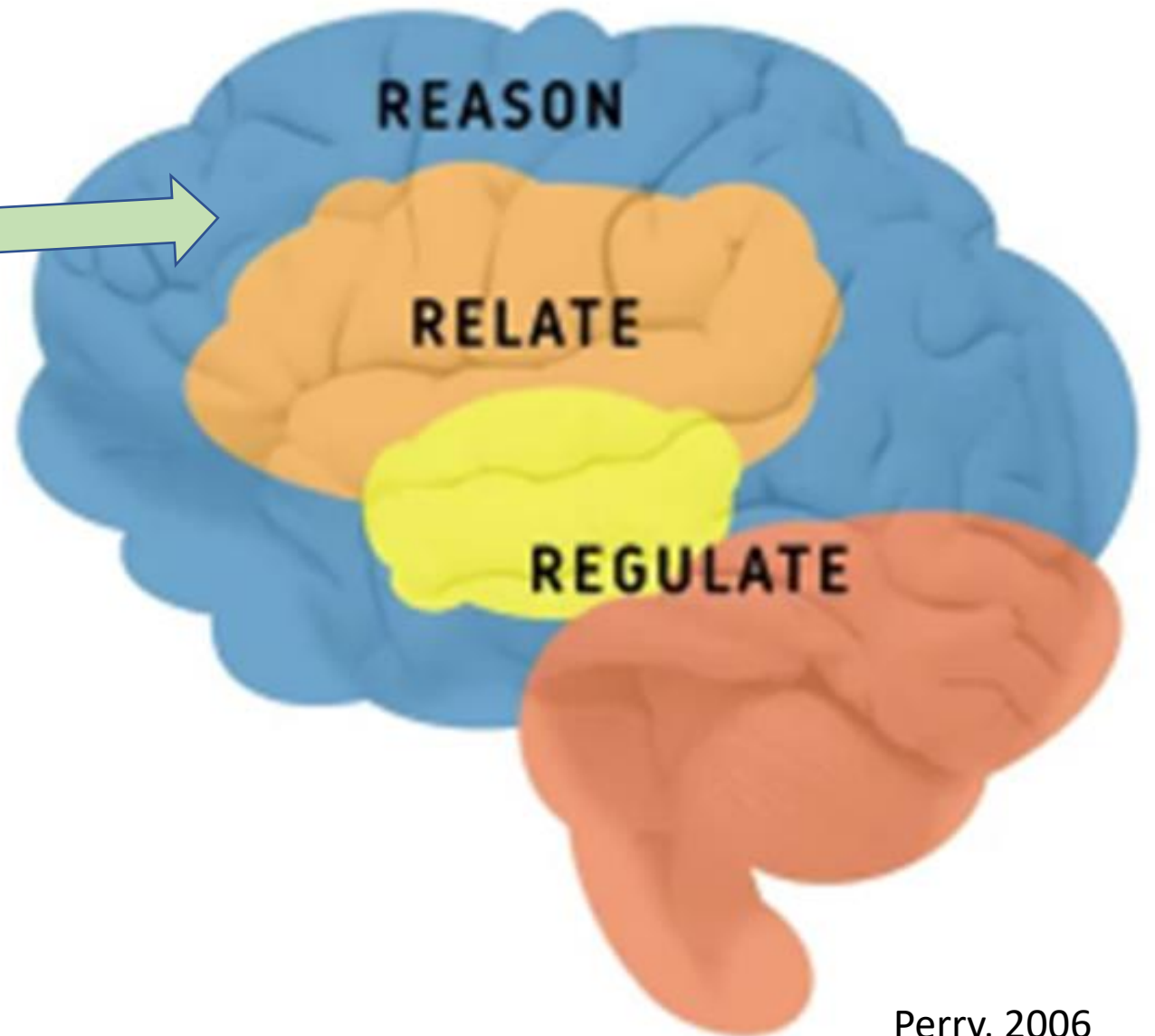


Perry, 2006

Neurosequential Model

Cortex:
Thinking

This part of the brain is our “adult
human” part.



Let me give you a human example...



Mom, Me and Twinkle

Let me give you a horse example...

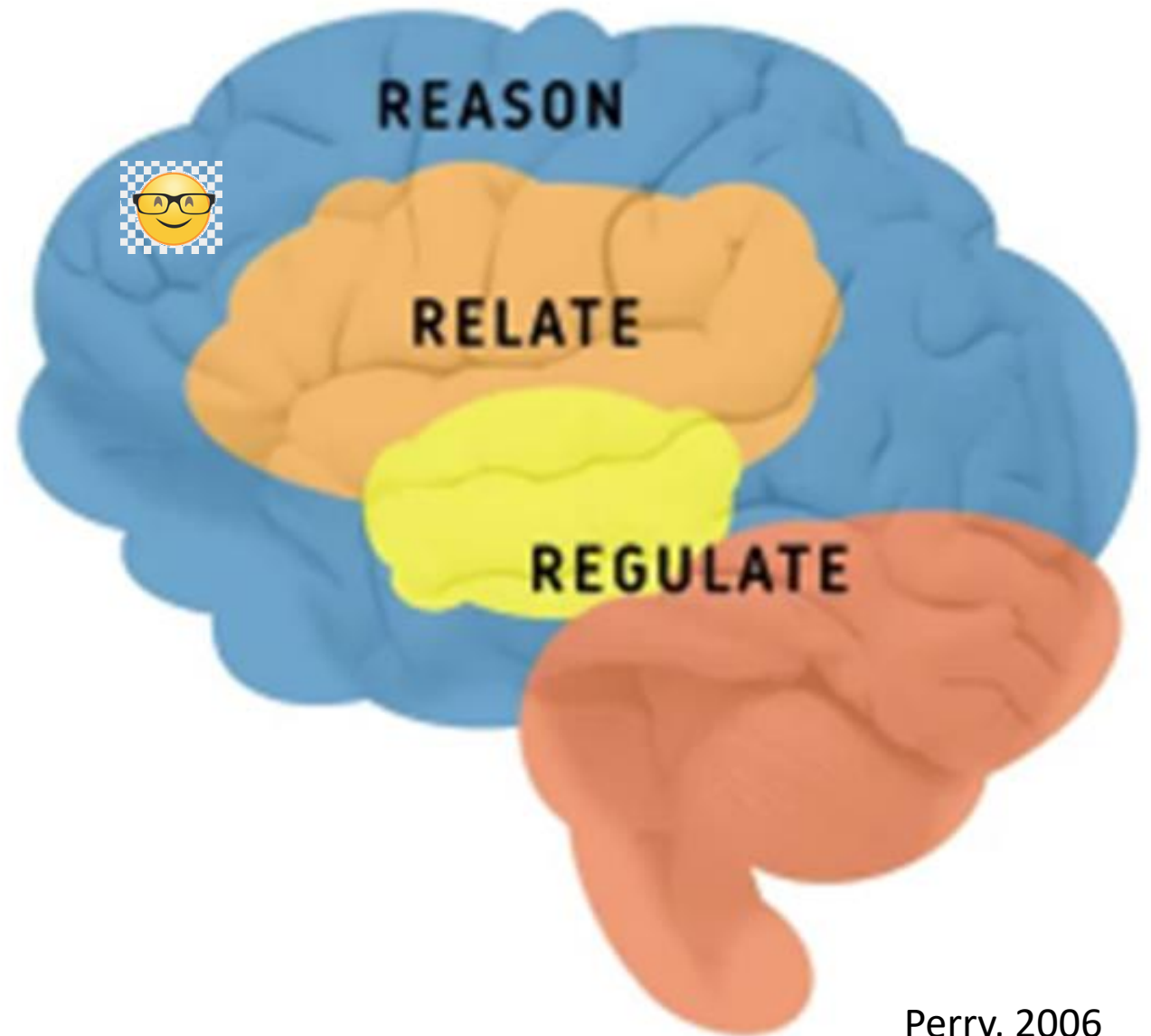


Hill City, South Dakota

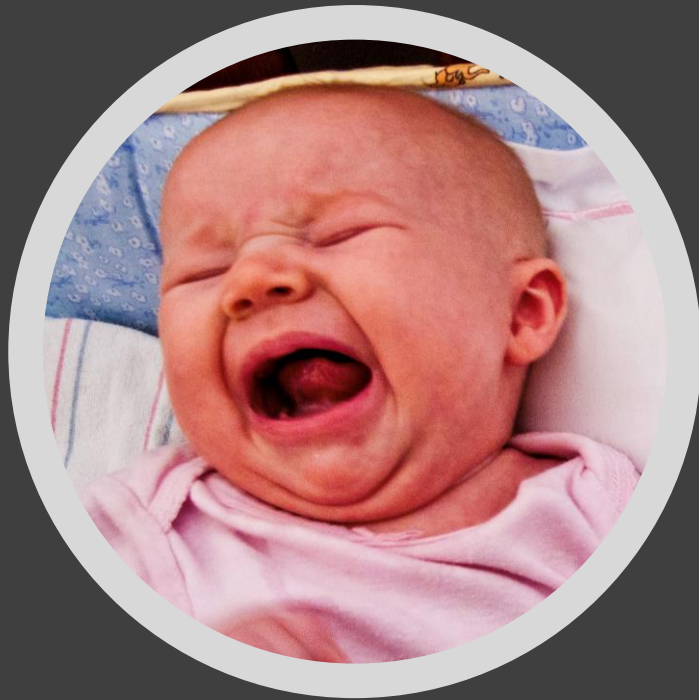


Mom on Sport

Neurosequential Model



Let's stay at
the top...



Part of this is developmental...



Most kids pick it up eventually

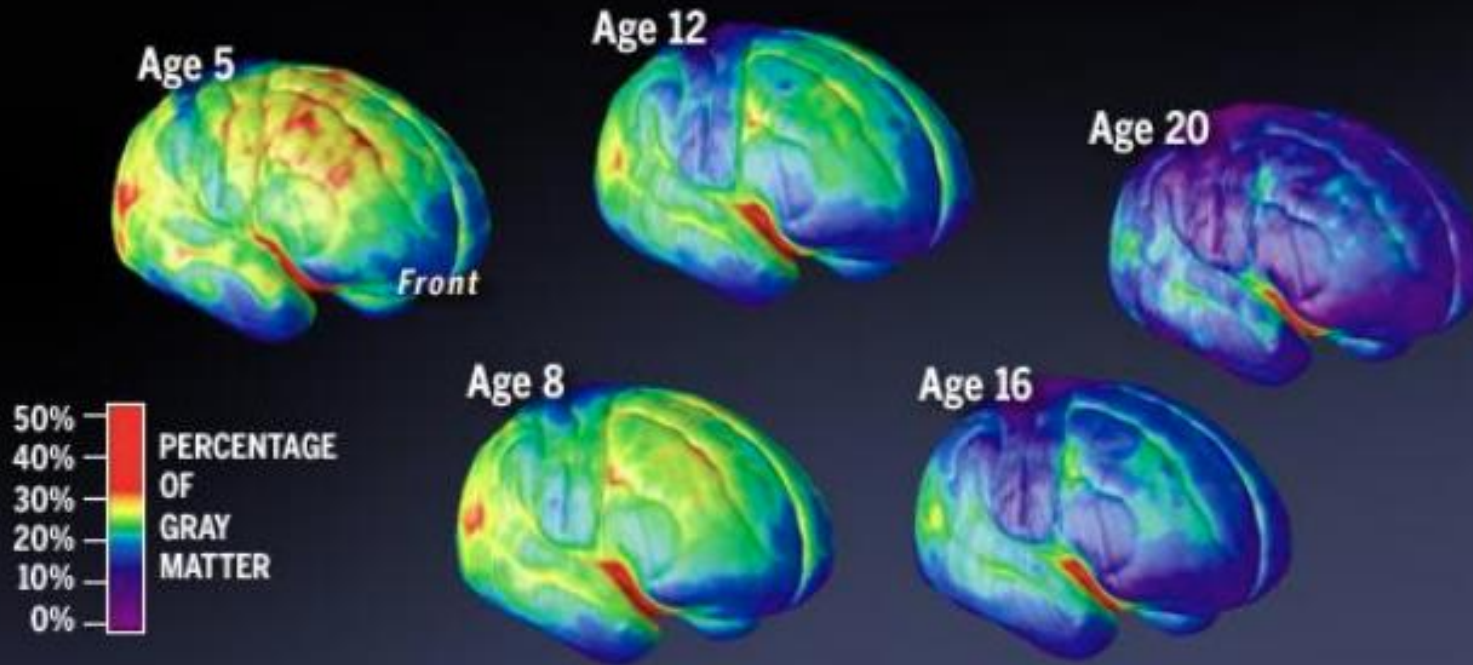


And most can control themselves as they get older...

Humans grow SLOWLY

Time-Lapse Brain

■ Gray matter wanes as the brain matures. Here 15 years of brain development are compressed into five images, showing a shift from red (least mature) to blue.



[« PREVIOUS](#)

[NEXT: Launch Flash Movie »](#)

The question is how?

Physiologically this is about PLASTICITY and PRUNING.

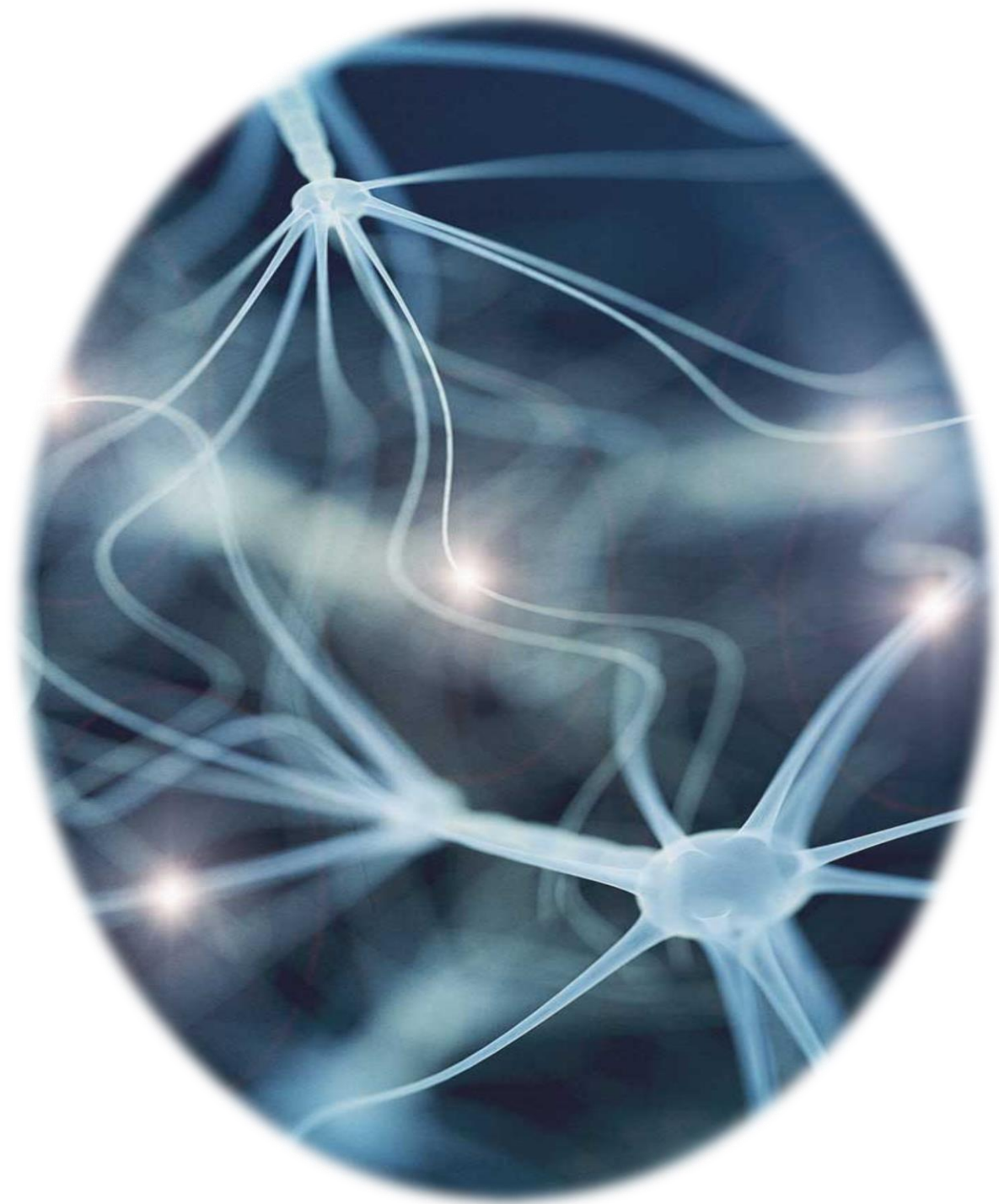
Cognitively this is about SCHEMA.



Neuroplasticity and Pruning

The brain
becomes what
the brain does.

-Dr. Douglas Gentile, Iowa State University



How the Brain Develops

- When babies are born, they have more brain cells (neurons) than they need, but these neurons are not yet connected together in meaningful ways.
- The job of the brain during early childhood is to make neurological connections so that the child can grow and develop.

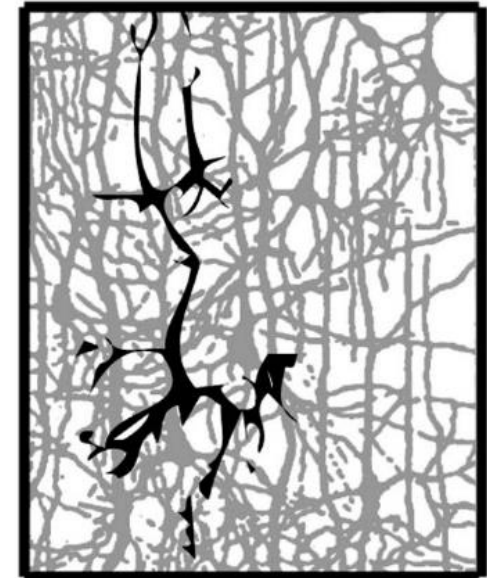
Neurons at

Birth



Neurons at

7 Years



Sort of like...



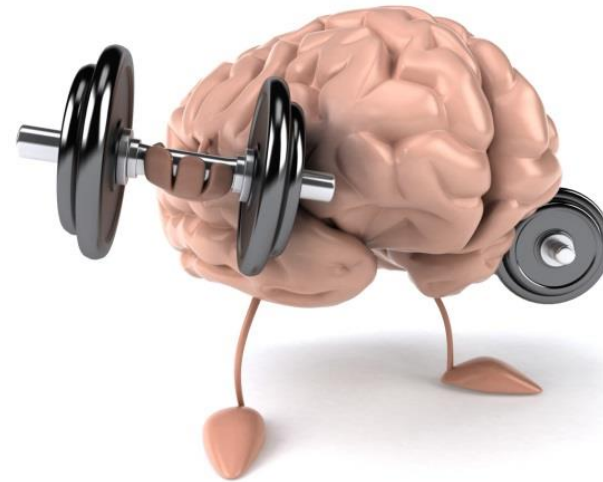
Into



How the Brain Develops

- The brain knows which connections to make based on what the brain is doing.
- If the brain does a lot of something, that part of the brain gets strong neurological connections which can be permanent.

Just like another muscle!



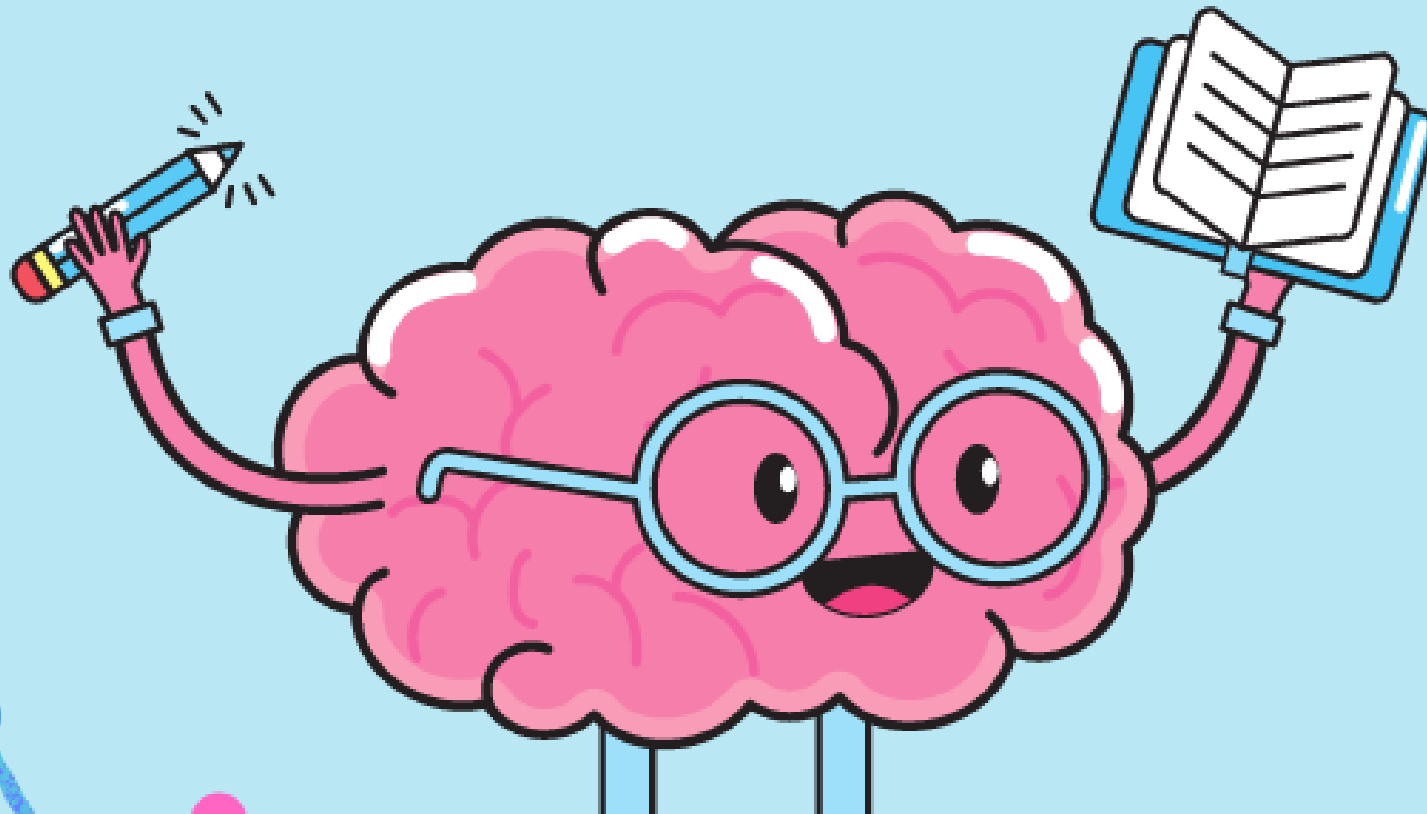
PLEASE
DON'T
READ
THIS



It works like this...

NEUROPLASTICITY

THE BRAIN'S SECRET SUPERPOWER



The good and the bad

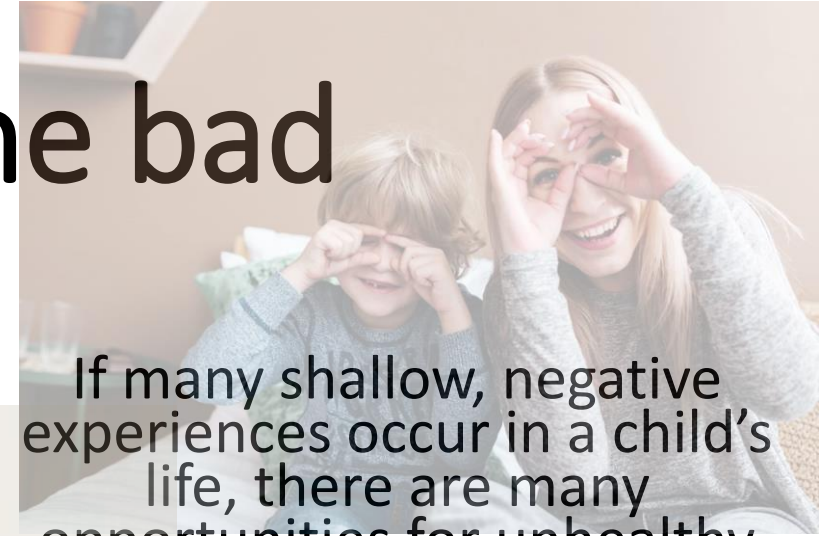
If many healthy, positive experiences occur in a child's life, there are many opportunities for healthy brain development.

Outcome? We get lots of healthy neurology.



If many shallow, negative experiences occur in a child's life, there are many opportunities for unhealthy brain development.

Outcome? We get lots of unhealthy neurology.





In humans, we call it stress reactivity: When the limbic system is always “on,” kids see threat everywhere and behave accordingly.



And horses are like that too...



Left: My sister and Flower

Right: Me and Twinkle

Barn sour



Head shy

BOTTOM LINE

A hand is shown drawing a thick red underline under the words "BOTTOM LINE" which are written in a bold, black, hand-drawn font on a white background. The hand is holding a red marker and is positioned on the right side of the underline.

All kids' brains (neurotypical and neurodiverse) can be impacted positively or negatively by their circumstances.



Pruning...

- Remember, the brain has more neurons than it needs.
- If the brain does not use certain areas, those neurons are **pruned** out of the system.
- The brain is “value neutral.” It does not know if neurons will be needed later or not. It just knows what is not being used.

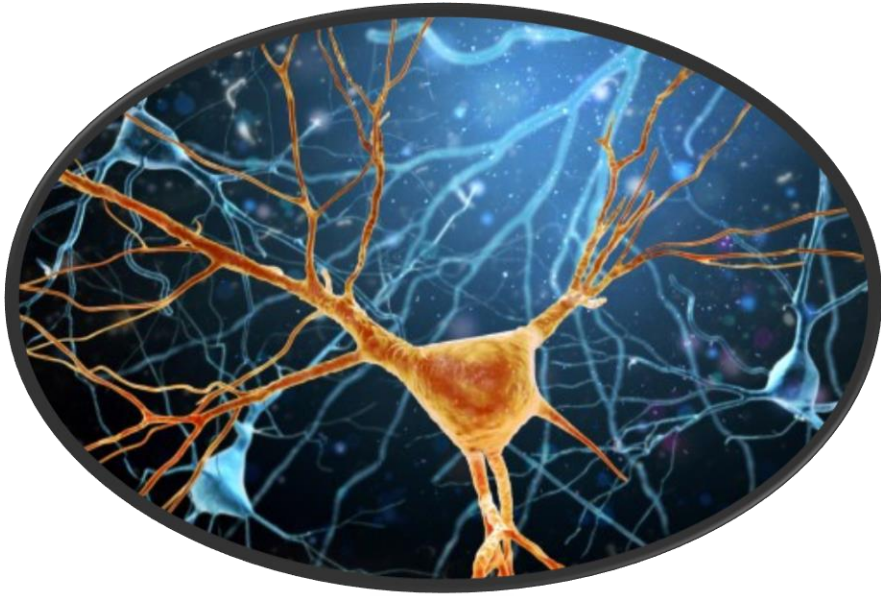
It is like the junk drawer



What is this thing?



The good and the bad



*Jen's Dad says:
Keep those thistles out of the
hayfield!*

When the right things are pruned,
there is more space for the
neurology we need.

When the wrong things are
pruned, we lose valuable potential.



Pruning

Children who have had chaotic and traumatic experiences, don't get much exercise of the frontal cortex. This means, some of it may be pruned away.



11 Sub-Skills of Executive Function



Executive functioning example

- If neurons are pruned in the frontal lobe, it doesn't mean someone **can never** do something. It means, it is **harder**.
- The more that is pruned, the harder it becomes.
- The older we are, the harder it is.



Horses are like that as well...

You don't break horses when they are colts because it isn't good for them.

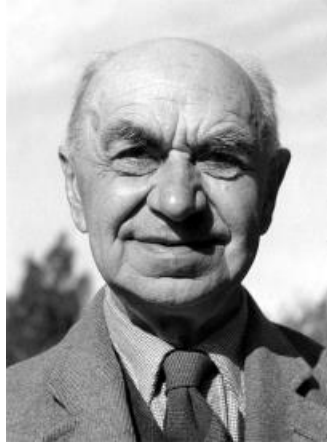
You don't break horses when they are five, because they are hard to break.



BOTTOM LINE

A hand is shown drawing a thick red line under the words "BOTTOM LINE" which are written in a bold, black, hand-drawn font on a white background. The hand is holding a red marker and is positioned on the right side of the line.

All kids' brains (neurotypical and neurodiverse) can be impacted positively or negatively by their circumstances.



The child has an altered SCHEMA
about relationships



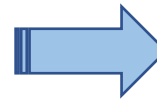
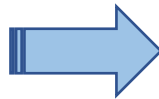
- A **schema** is a cognitive framework or concept that helps organize and interpret information.
- Schemas can be useful because they allow us to take shortcuts in interpreting the vast amount of information that is available in our environment.
- First introduced by Frederick Bartlett, our understanding of the world is formed by a network of abstract mental structures. This concept was made famous by Jean Piaget.

How schema works...



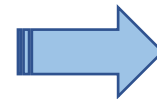
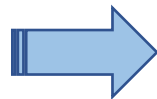
SCHEMA about relationships

- If we have healthy, nurturing, securely attached relationships in early childhood, the information in our file folders is also healthy!
- Every time we reach into our brain to access the information we need, we have healthy information to draw from which tells us how to act in our environment.



SCHEMA about relationships

- If we have experienced chaotic, unpredictable and terrorizing relationships, that information still goes into our file folders.
- In this situation, when we reach into our brain to access the information we need, we have unhealthy information to draw from. This information also tells us how to act in our environment.





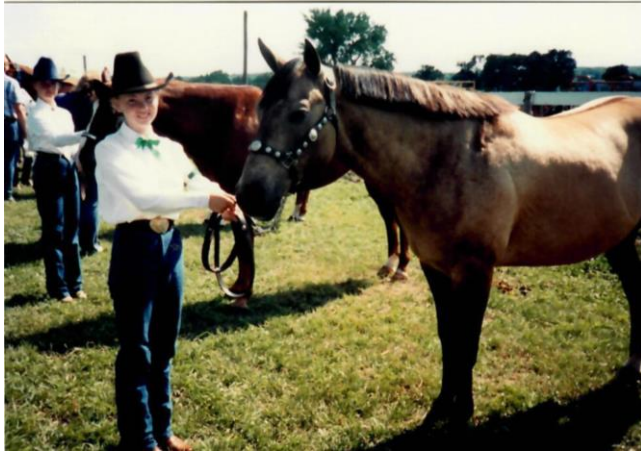
And it is true for horses too...

A photograph of a man and a young boy high-fiving on a horse. The boy is wearing a brown riding helmet and an orange t-shirt, sitting on the horse. The man is wearing a white shirt and is reaching up to high-five the boy. The background is a blurred outdoor setting with trees and a building.

And it's contagious...

- Horses are chosen as therapy animals based partially on their ability to withstand a great deal of distraction and tolerate unpredictable or erratic behavior from people.
- Many have been trained to exhibit especially gentle and repetitive behaviors to put people at ease and make their interactions more predictable.
- Horses have a natural ability to pick up on human emotional expressions and needs.
- Horses are able to mirror human moods in a nonjudgmental way without motive or expectations.

Schema for Efficacy and Mastery



Buck and me
Showmanship at Halter



Joe and me
Big Horn Mountains, Wyoming

Jen's mom says
"You are a rider,
not a passenger."



Twinkle and me
Walk Trot class



Buck and me
Big Horn Mountains, Wyoming



Buck and me
Big Horn Mountains, Wyoming



Buck and me
Emmet County Fair

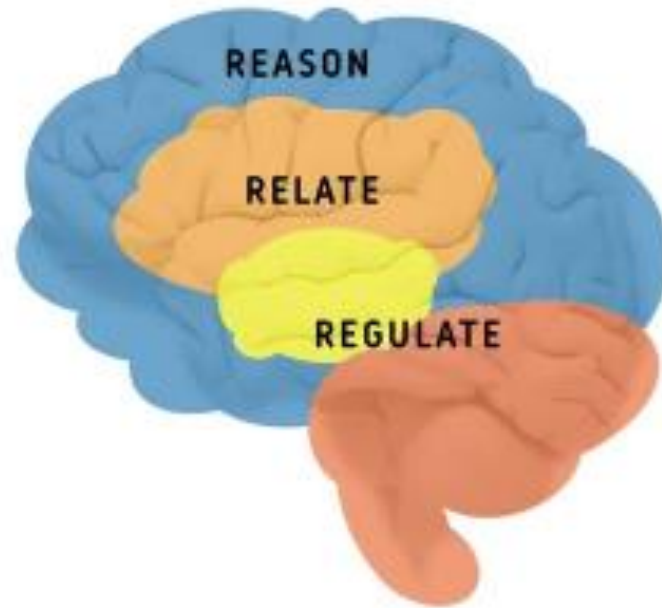
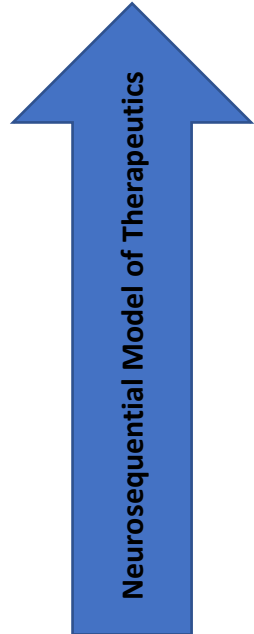
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All kids' brains (neurotypical and neurodiverse) can be impacted positively or negatively by their circumstances.

What does this mean for my program?

FOLLOW THE RULES OF THE BRAIN



What can I learn from this?

Do I matter?

Am I safe?

(Perry, 2006)

Let's Hear It
From the
Expert!



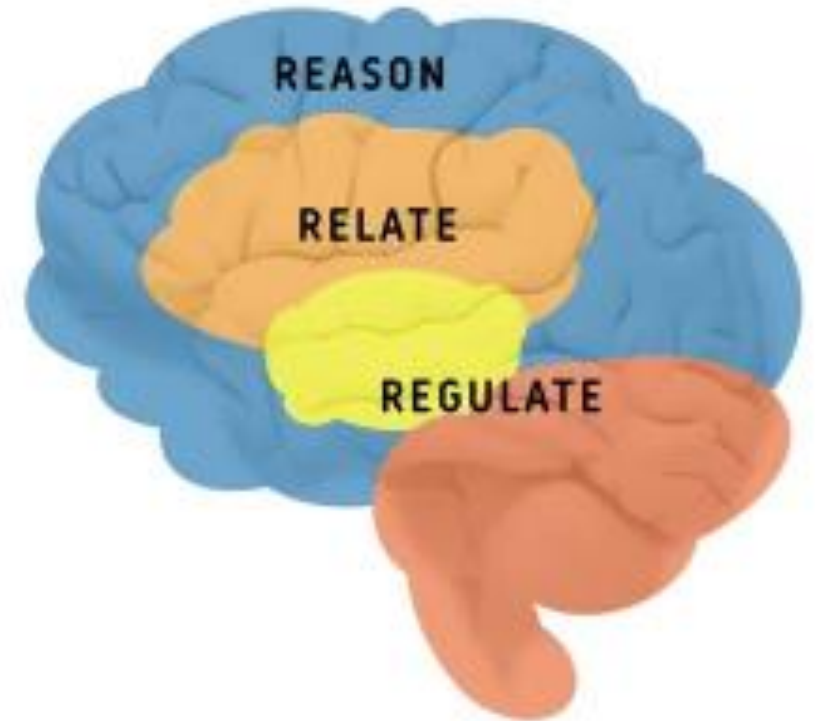
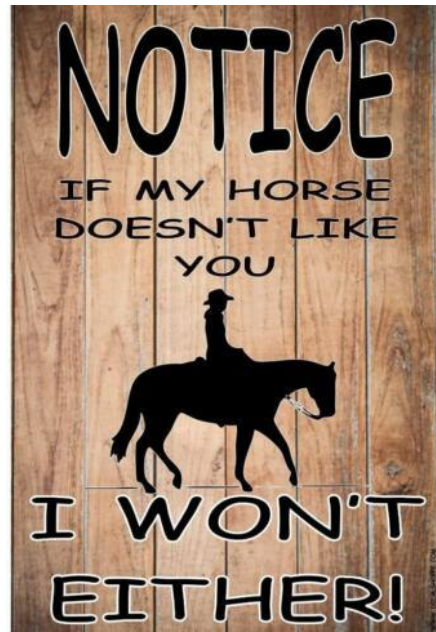
What does this mean for my program?

Safety, safety, safety



Physical Safety

Psychological Safety

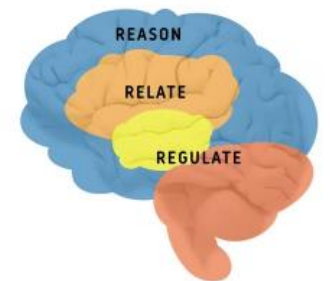


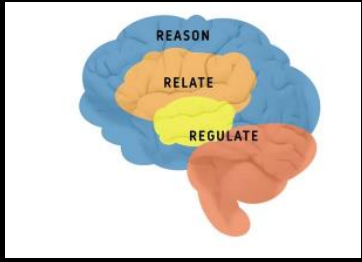
What does this mean for my program?



Where is the rider's ZPD?

This is the place where you are challenging the rider ENOUGH to GROW, but not so much that it pushes them to the bottom of their brain.





What does this mean for my program?

Low touch to high touch

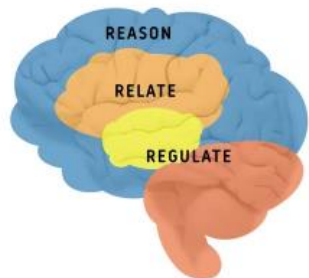
Low trust to high trust

Go slow to go fast



What does this mean for my program?

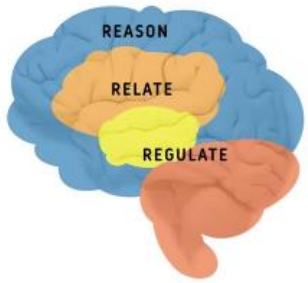
- Predictability
- Routines
- Schedules
- Procedures



Examples

- How do they enter the barn?
- How do they approach the horse?
- What do they do first, second, third, etc.?
- What safety rules do they have to follow?
- How do they provide care for the horse after riding?
- How do they exit the barn?





Think about

NEURODIVERSITY

Individuals who are neurodiverse don't always process information in the same way and at the same speed as others.

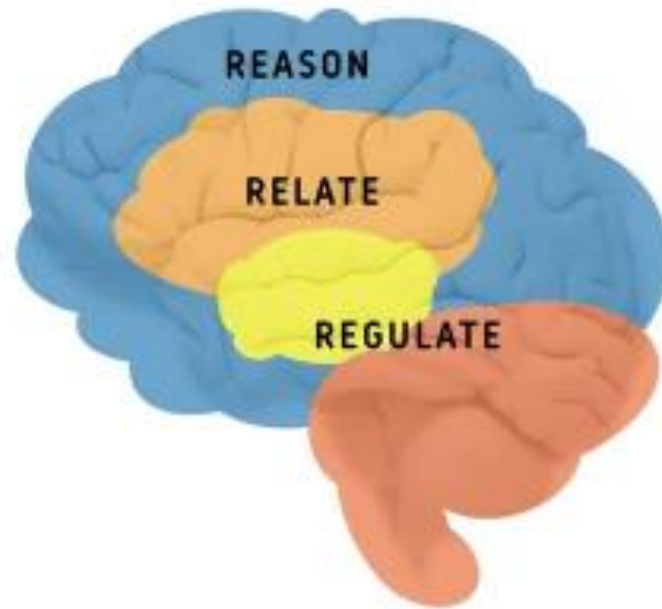
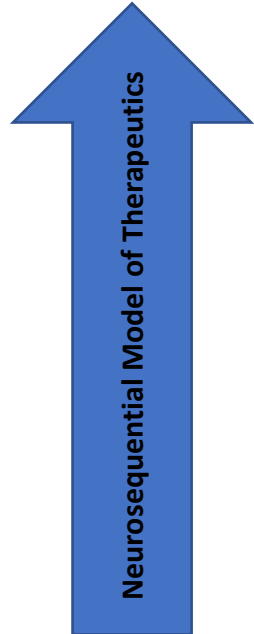
How can you teach, re-teach and reinforce procedures in ways that respect the neurodiversity of riders?



How do I create connection?

- Riders and Horses
- Riders and Volunteers
- Riders and Staff
- Riders and Riders
- What role does orientation and training play in connection?

Programs can be successful when we follow the rules of the brain...



What can I learn from this?

Do I matter?

Am I safe?

(Perry, 2006)

Thank
you