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.
• 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

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

Perry, 2006
Brain Stem: Automatic functions of the body

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

Neurosequential Model

Perry, 2006
Limbic Brain: Emotional Regulation

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

Neurosequential Model

Perry, 2006
Limbic Brain: Relationship

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

Neurosequential Model

Perry, 2006
This part of the brain is our “adult human” part.

Perry, 2006
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
Let’s stay at the top…

Neurosequential Model

Perry, 2006
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.

- **Age 5**
- **Age 12**
- **Age 20**
- **Front**
- **Age 8**
- **Age 16**

**PERCENTAGE OF GRAY MATTER**

- 50%
- 40%
- 30%
- 20%
- 10%
- 0%
The question is how?

Physiologically this is about PLASTICITY and PRUNING.
Cognitively this is about SCHEMA.
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.
Sort of like...
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!
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
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

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.

Jen’s Dad says:
Keep those thistles out of the hayfield!
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.
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.
All kids’ brains (neurotypical and neurodiverse) can be impacted positively or negatively by their circumstances.
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...
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

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

Jen’s mom says
“You are a rider, not a passenger.”
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?
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...

(Perry, 2006)