Changing Role of Horses

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Main points of this talk

- Review changing role
- Ultimate and Proximate Explanation
- Evolution & Domestication
- Theory of Mind
- Mirror neurons
- Participation in reading horses emotions

Role of horses:

- Hunted
- Livestock
- Carried our supplies
- Transportation

- War
- Support for livestock management

Partners in war

- Transportation

- Plowed our fields

What happened when automobiles and tractors became available?

Trains replaced the horse for transporting mail in the U.S.

Relationship with horse evolved into..

- Sport and competition

Horses and humans in competition…

Family Recreation & Trail Riding

More recently…..horses in therapy

- Physical Therapy

- Mental Health

Animal Assisted Therapy

- Horses are a subset of a larger industry that partners with animals for therapy and assistance

- But horses are playing a unique role

Horses providing therapy

- Group Work

- Individual session

New Role for Horses

- Goals for physical therapy

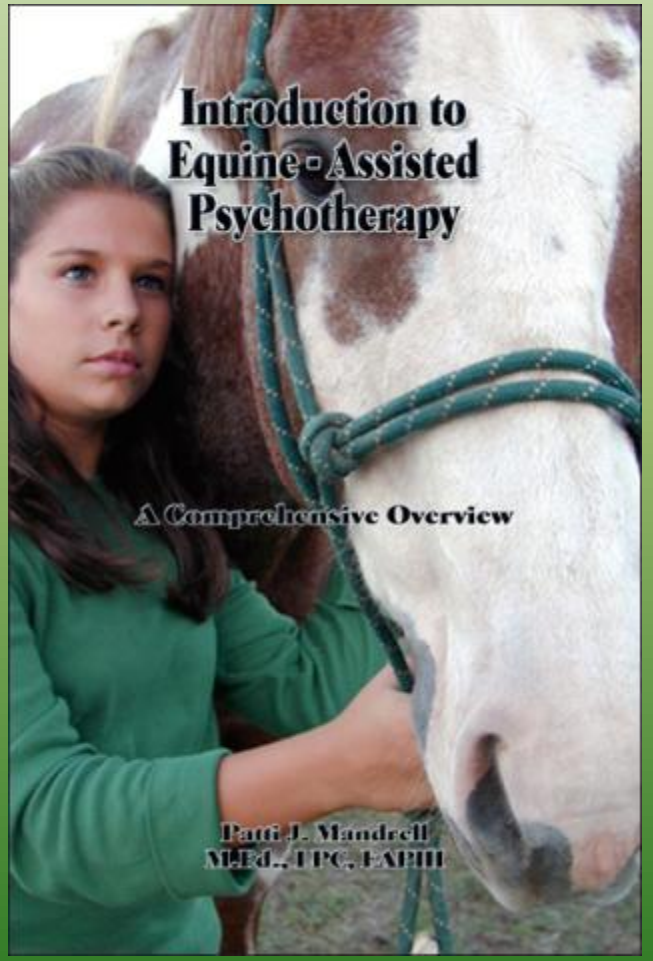
- Improved core strength
- Proprioception and balance
- Abductor –adductor strength
- Mobil independence

- Mental health and counseling

- Impulsivity
- Poor decision making
- Difficulty handling frustration
- Argumentative behavior
- Difficulty accepting responsibility
- Marriage or family problems

Equine Facilitated Psychotherapy

- Over 20,000 hits on Google
- Offering mental health services with horses
- Profit & non-profit organizations
- Large & small business



Organizations Involved

- Founded in July 1999, the Equine Assisted Growth and Learning Association (EAGALA) is a non-profit organization developed to address the need for resources, education, and professionalism in Equine Assisted Psychotherapy and Equine Assisted Learning.

EGEA

EQUINE GUIDED EDUCATION ASSOCIATION

- “Our goal is to re-connect people to land and nature, so that we may re-find what has heart and meaning, forgive what has been broken, find hope in times of uncertainty, and walk a path of integrity and grace”.

Ariana Strozzi, Co-Founder and President of EGEA

EAHAE
HORSE ASSISTED EDUCATION

European Association for Horse Assisted Education

is a non-profit platform for information, communication, education, certification, research and publication of every kind of Horse Assisted Education.

Equine Assisted Learning

- Google will result in over 39,000 hits

Horse provides a special kind experience

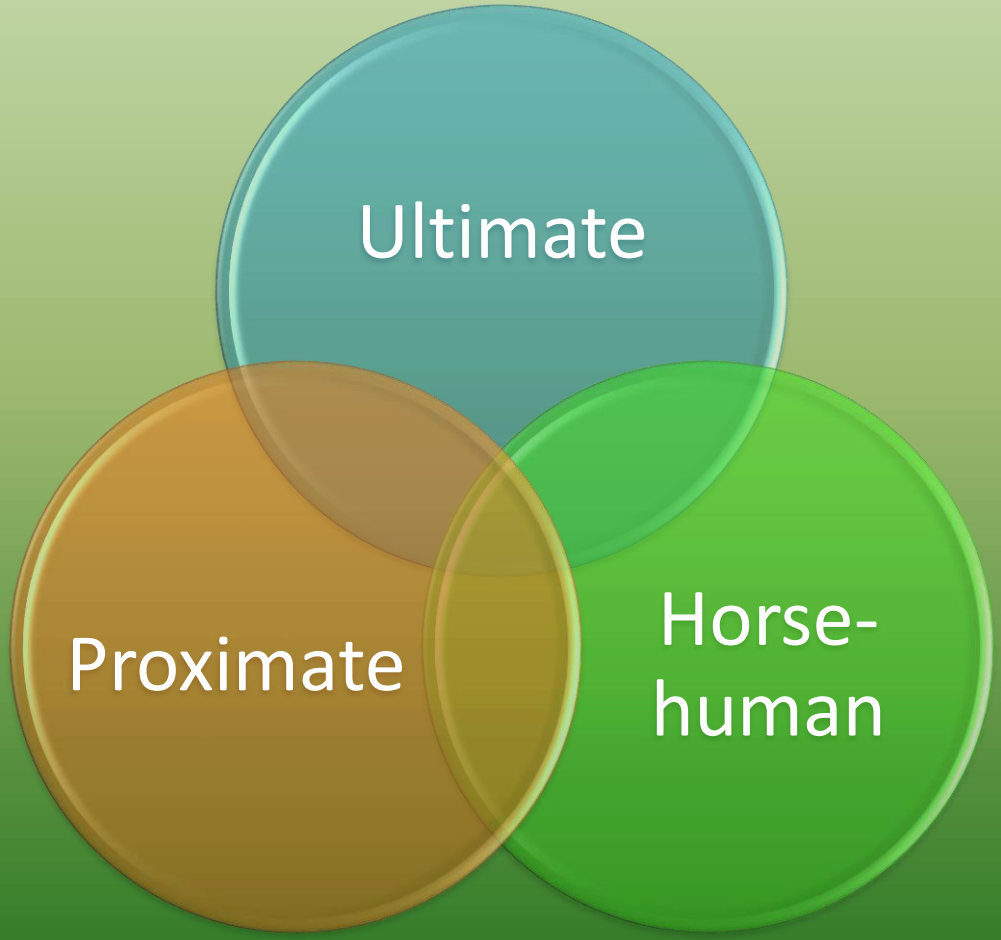
Horses help humans heal and grow

- It is a fact.
- Based on thousands of testimonials.
- But why & how can horses help?

The new industry needs…

- Evidence based research
- Data
- Theoretical understanding of mechanisms

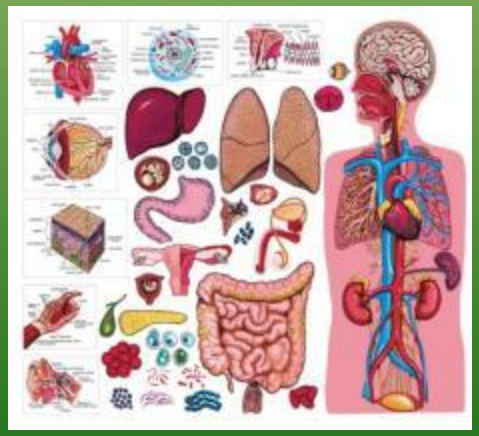
Why is the horse so effective in forms of therapy?



Scientists explain behavioral phenomenon

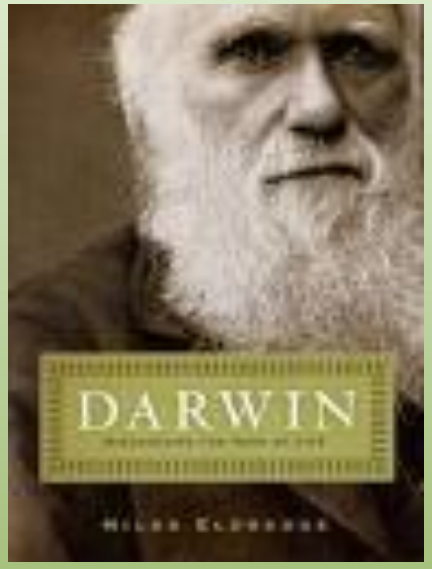
- Ultimate explanation
- Tells us WHY….
- Answer is…. behavior helps the horse survive and reproduce

- Proximate explanation
- Tells us HOW…..
- The behavior is mediated by a physiological mechanism



Unique relationship with Equus

- Why did humans choose HORSES to be the animals that we ride?
- How has our unique relationship developed over time?



This Brings us to the theory of

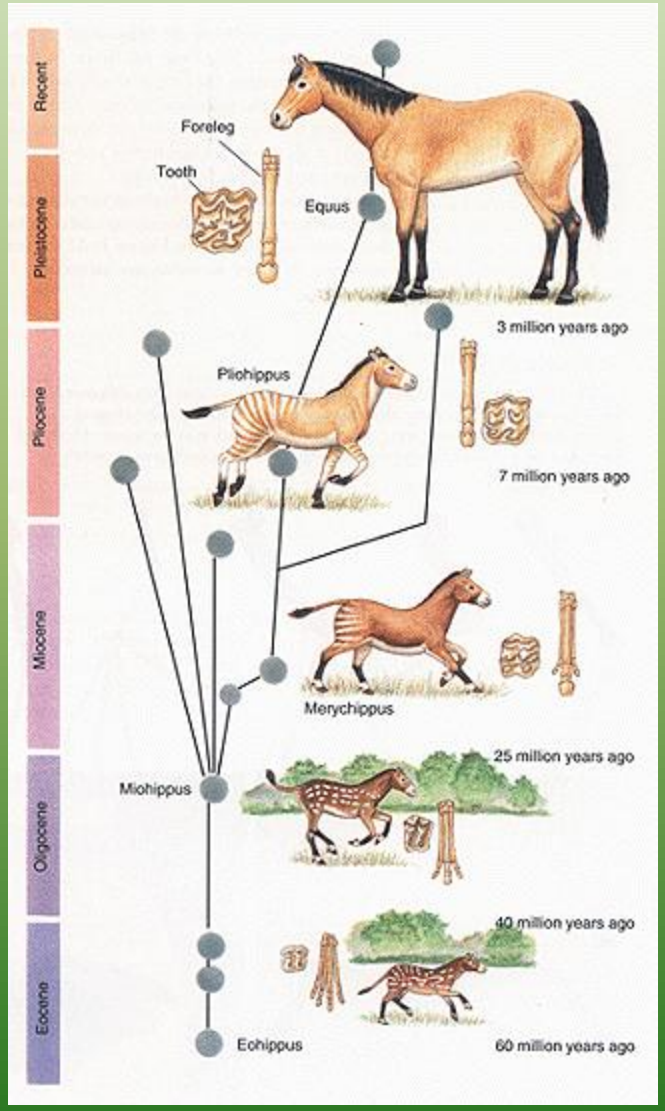
Evolution

Evolution

Forces of nature and changing conditions will mold and dictate

The best adapted body

Most adaptive behavior



Co-evolution

- Where two (or more) species reciprocally affect each other's evolution

Co-evolution

- May or may not be beneficial to both, but is a benefit to at least one specie
- Population (gene pool) influenced by the relationship

- Mutualism..both
- Parasitism ….help one, harm another
- Commensalism …help one and neutral to another

Equine Domestication

Domestication of Horses

Likely occurred in many different locations simultaneously (not America)

Current theory ….mtDNA show modern horses come from large number of different populations

The New Relationship

- Capture, taming and rearing was applied by each culture on the wild horses of their geographic area

Domestication

- The added value & various uses of horses spread rapidly
- No longer just used for food……but to conquer others and succeed at acquiring resources

And then a miracle happened!

- Humans discovered another kind of partnership with this amazing animal
- Impossible to put exact date on the capture and taming of horses
- Some one got on and RODE!

Selective Breeding

- Systematic breeding gave rise to the varied breeds of today

Have Humans and Horses Co-evolved?

- Were our ancestors who domesticated horses
- better fit than humans who could not or did not domestic the horse?

Why Horses?

- Why did humans choose HORSES to be the animals to ride ?
- Why were they our partners for conquering the world????

Shouldn’t we ask….

- Why did horses allow humans to capt tame and event on their backs a

- This activity has happened with many species

Another loser

Why the Horse?

What qualities does the horse have that help generate & produce meaningful relationships with humans?

They Are Beautiful

Horses have the largest eye of all land mammals

Because they are family oriented

They are so curious

Maybe they played a role in their own domestication……..

Maybe Horses Choose Us

Perkins' Hypothesis

- Horses have keen ability to determine intentions of humans….
  - friend or foe
  - predator or curator
  - honest or deceitful
  - brave or fearful

Those with keenest ability were selectively bred.

Perkins Hypothesis

- Humans have keen ability to read horses intentions
- Those who did a good job had adaptive advantages

Co- evolution Hypothesis

- Increased advantages for humans most capable of taming, training & using horses.

- Increased advantages for horses that adapted well to captive environment and service to humans.

End of Evolution Lesson

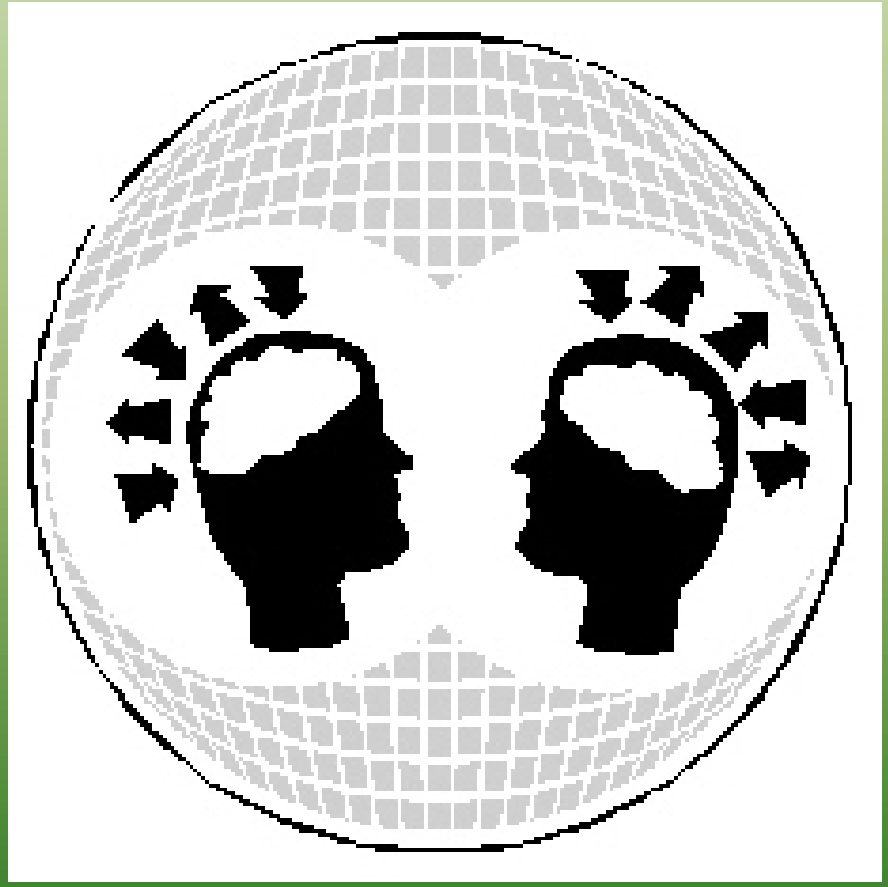
But co-evolution does not explain **HOW** horses read human intent or **HOW** humans read and understand horse intent.

This brings us to the theory of

Mind

Theory of Mind

- Allows us to describe “human” behavior based on mental states
- Allows us to attribute “mental states” to others
- Allows us to manipulate others because we can “imagine” how they might respond to our actions
- Baron-Choen



Theory of Mind

- Human brain can put oneself in another's position
  - feel or experience how they may feel

Theory of Mind

- Can animals infer the intentions , desires or state of mind of others?

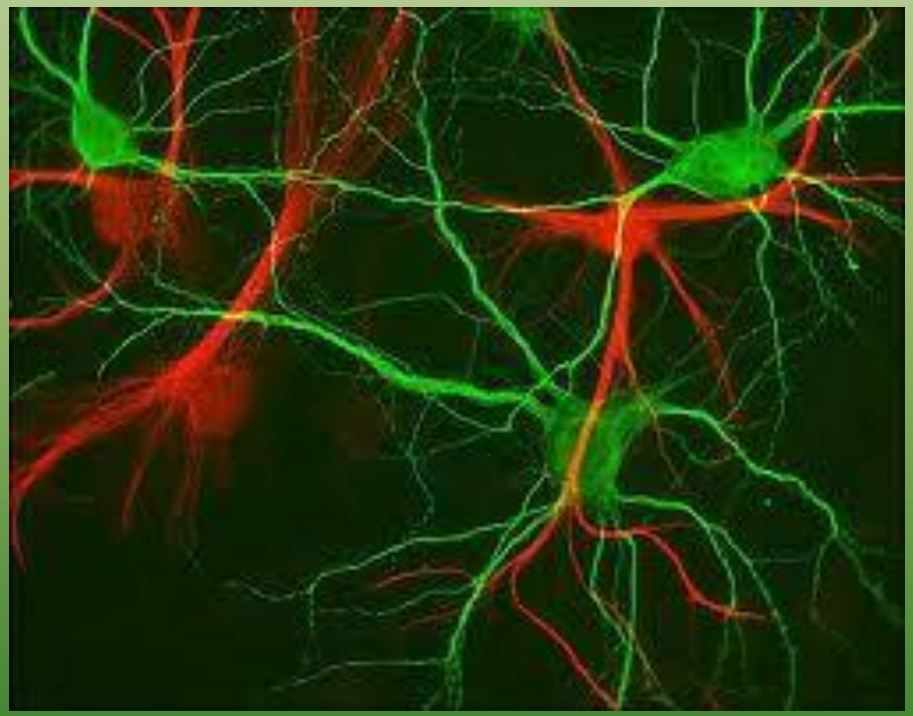
Theory of Mind

- Yes animals can!!!!
  - Research in the behavior of *"**deception**"*
  - Recent research in "***self recognition***"
  - Recent discovery of "***mirror neurons***"

How can Scientists objectively validate animal minds?

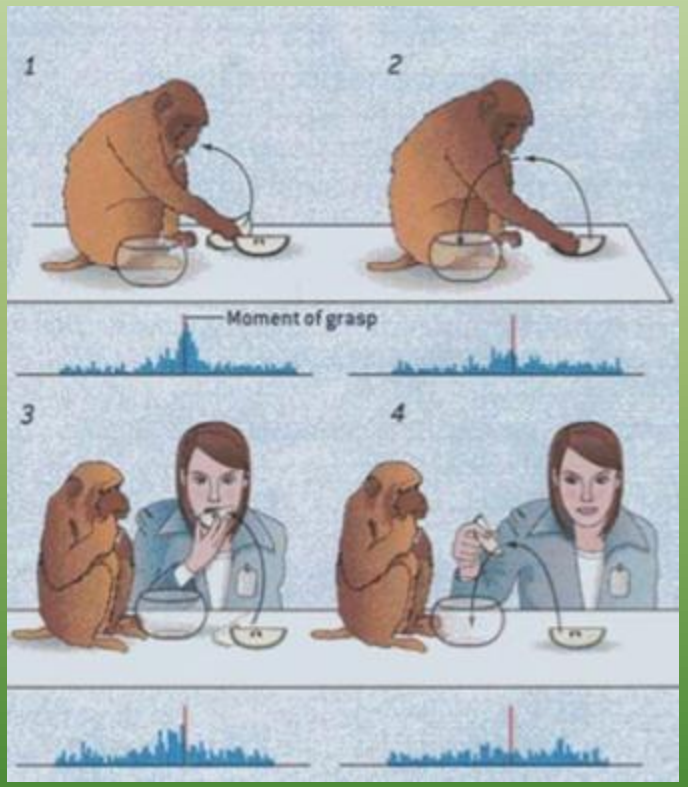
Discovery of Mirror neurons

A case for empathy and communication , and “theory of mind”



Mirror Neurons

- First discovered in 1996 in Macaque Monkeys
- Rizzolatti & Craighero (2004)
- Neurons in the neocortex fire when one is observing and predicting the action of another



Monkey see Monkey do

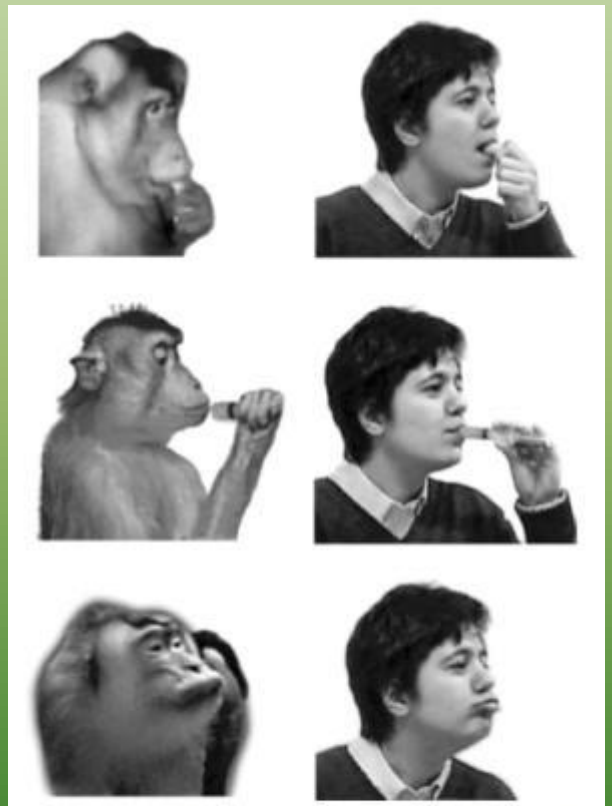


FIG. 1. Examples of transitive and intransitive actions performed by the experimenter in front of the recorded monkey (right column); same gestures made by the monkey (left column). Intransitive monkey actions, although rarely evoked during recording sessions, are shown here to outline their similarity with the same actions performed by the experimenter. From top to bottom: grasping of a piece of food; sucking juice from a syringe; lips protruded face.

Kinesthetic Empathy

- My pre-motor cortex fires when I see your body responding to a situation.

- “Couch potato athlete”

Kinesthetic Empathy

- What do you feel in your body when you see this?

Mirror Neurons

- Mirror neurons correlate with action understanding
- Triggers “motor representations in an observer”

Mirror Facial Behaviors

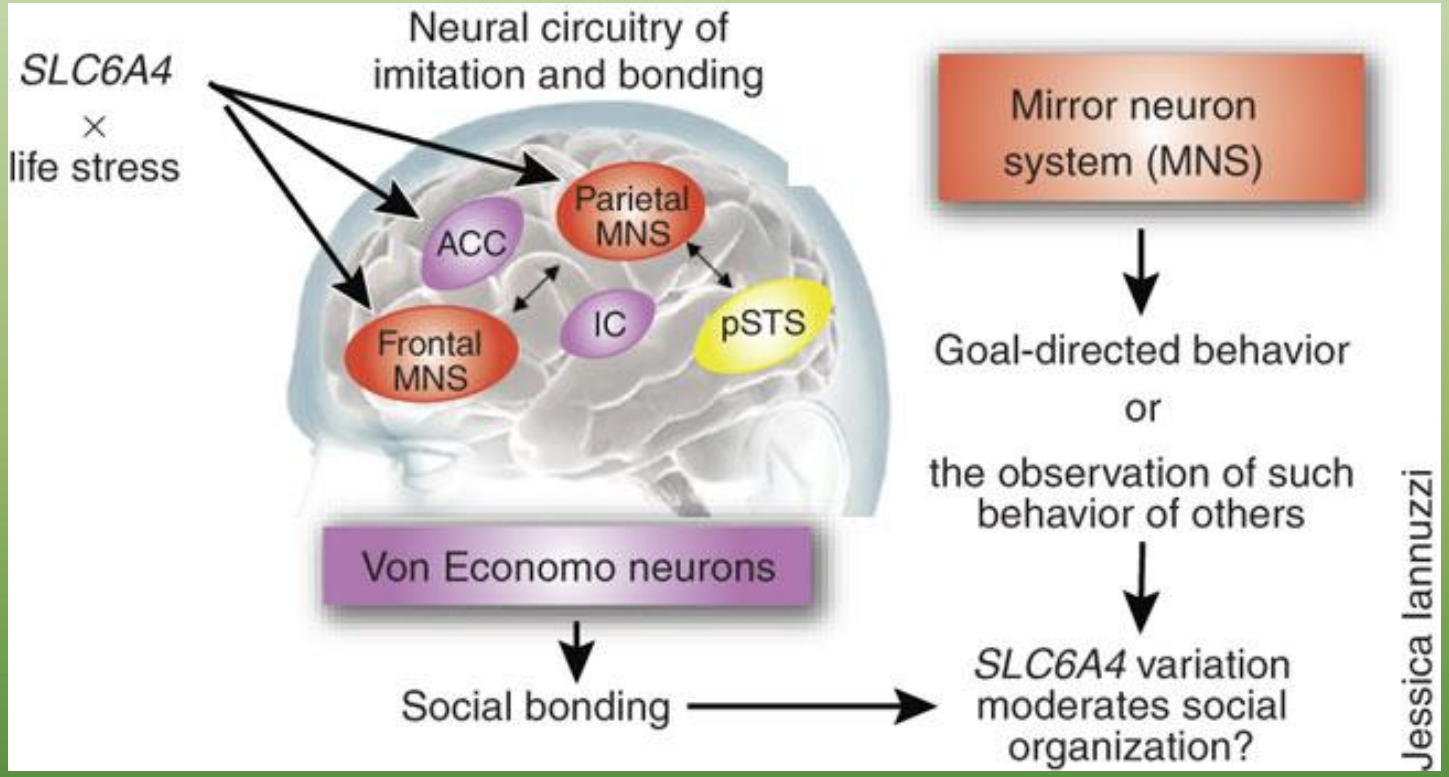
Genetically prepared to imitate

Serotonin regulating genes are involved in mirror neuron activity

Turhan Canli & Klaus-Peter Lesch

Nature Neuroscience 10, 1103 - 1109 (2007)
Published online: 28 August 2007
doi:10.1038/nn1964

Systems regulating social Interactions

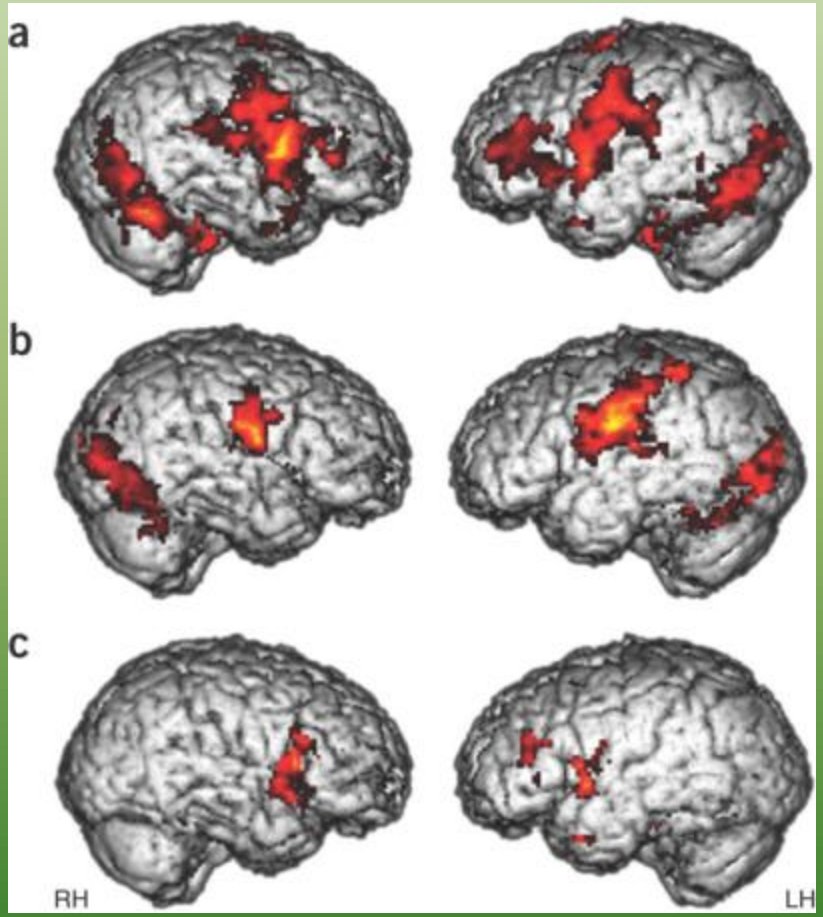


Influence of interaction between *SLC6A4* and environment on neural networks of social cognition and emotion regulation

Mirror Neuron System

- Similar neurons will fire in an observers brain…..This allows us to think and feel what others are thinking and feeling

- Does this help us understand what horses are thinking & feeling?



Mirror Neurons

- Recognition of facial expressions (universal for humans)
- Dysfunction of MN may result in autism and social pathologies

Mirror Neurons - Implications:

- Neurophysiological mechanism
  - "Theory of Mind" in animals
  - Imitation behavior

- **Possible theoretical framework for Equine Guided Work**

Can you read these faces?

Darwin and Eckman

Happy, sad, disgust, surprise, fear, anger

Now Try Interpret these Faces

Reading Horse's Minds

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1. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

2. Which emotion fits best?

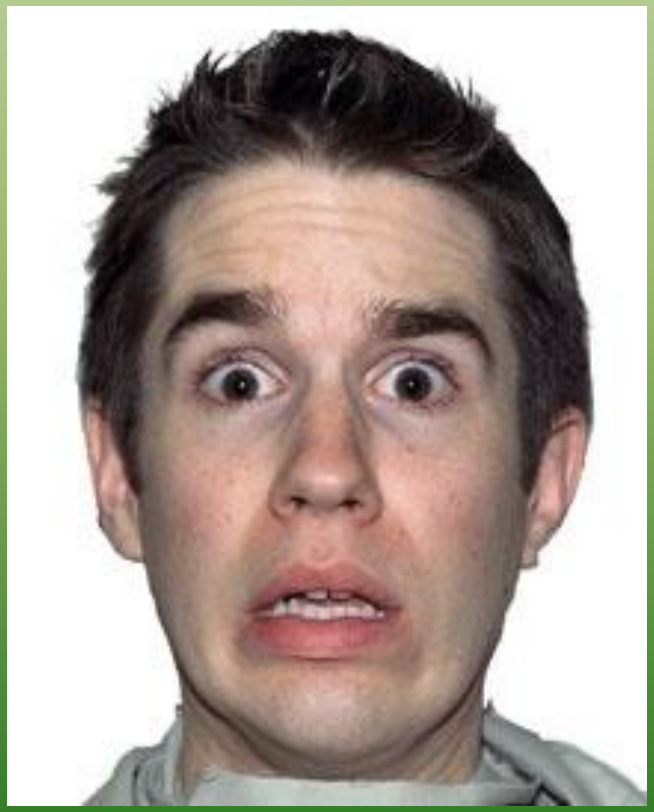
- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

3. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

4. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**



5. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

6. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

7. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

8. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

9. Which emotion fits best?

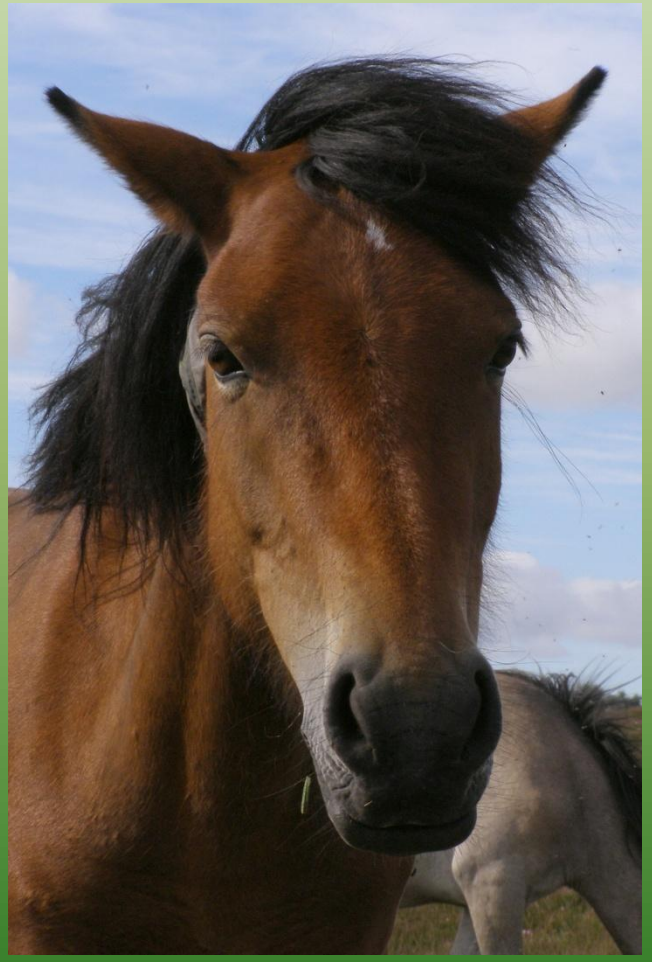
- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

10. Which emotion fits best for the horse on the right?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

11. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**



12. Which emotion fits best?

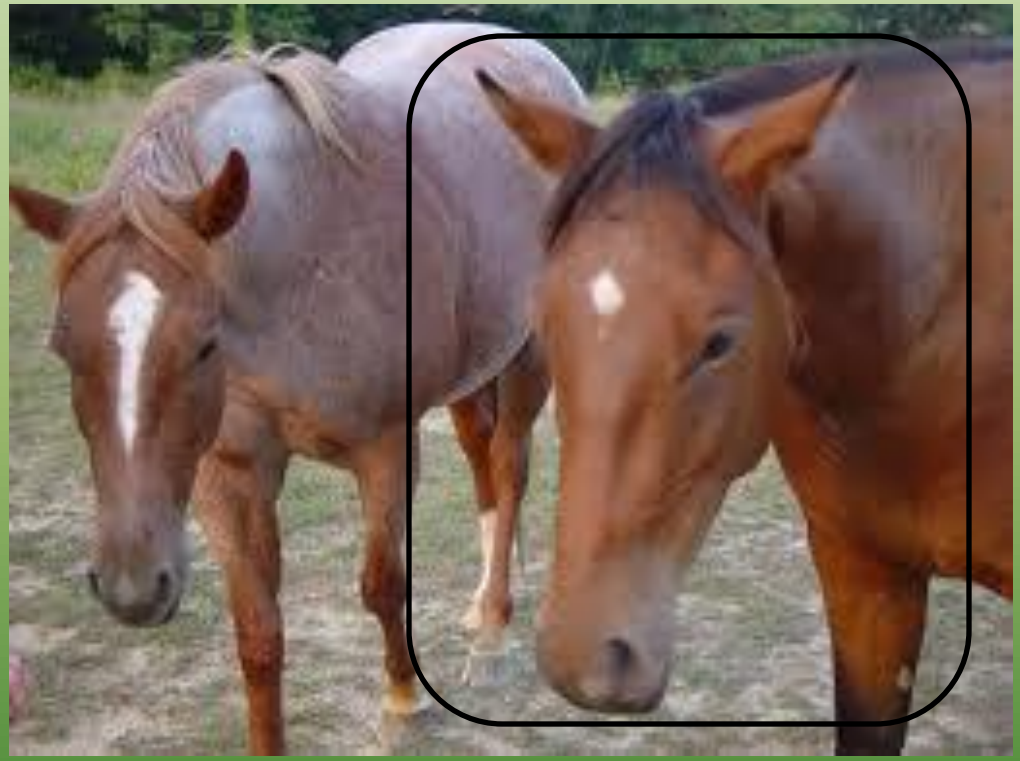
- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

13. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

14. Which emotion fits best for the horse on the right?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**



15. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

16. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

17. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

18. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

19. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

20. Which emotion fits best?

- **Anger**
- **Attentive**
- **Fear**
- **Happy**
- **Sad/Pain**
- **Surprise**

Thank you for participating

- Ritva Kjaldman
- American Society of Animal Science