

Neuroscience & Mental Health

Presented by Samantha Garner

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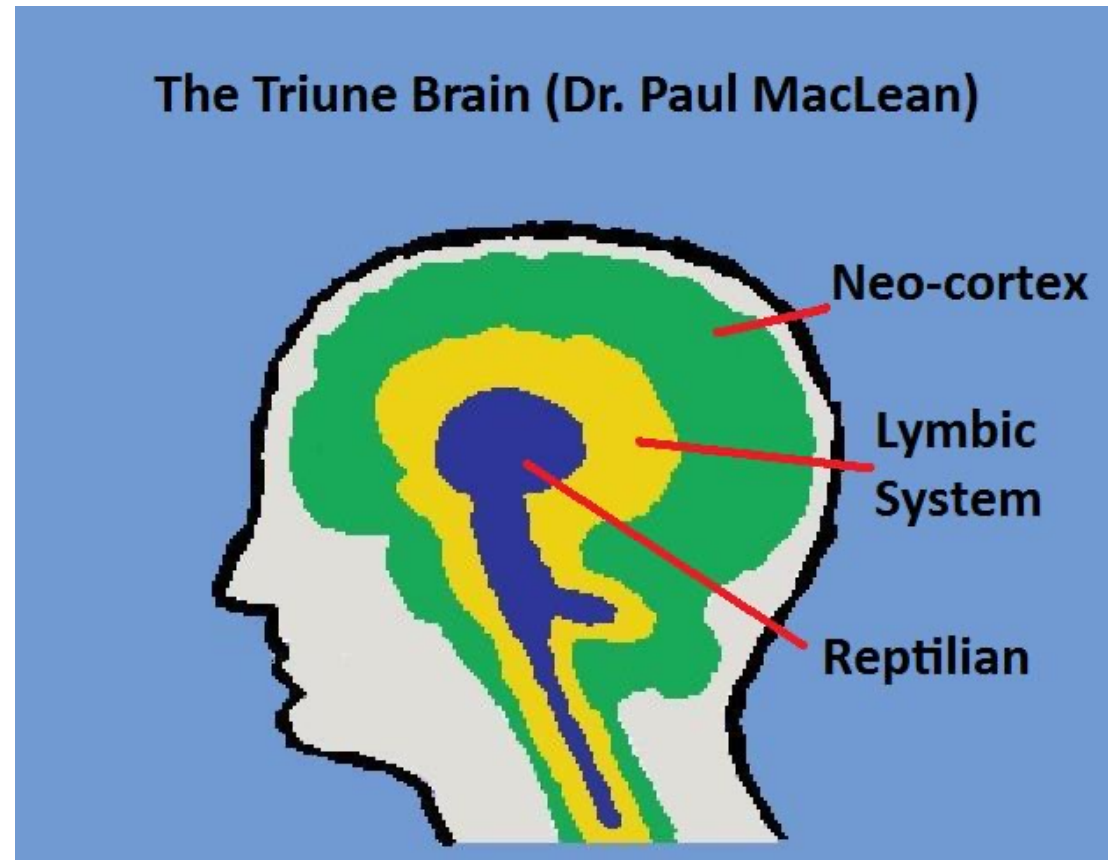
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Welcome

Neuroscience

- study of nervous system
- focuses on the brain and it's impact on behaviour
- looks at cognitive functions/how we think
- helping us support mental health
- knowledge and research being transferred into classroom

Our Brains



<http://attachmentdisorderhealing.com/wp-content/uploads/2014/02/Triune-Brain1-McClean.jpg>

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New Born Baby

- only basic synapses (connections) present – heart, breathing, eating sleeping etc
- mammalian brain in charge at birth
- billions of new synapses grow from birth onwards
- from age of two unused synapses discarded, used ones strengthened
- synaptic pruning continues until mid 20's
- experiences and environment dictates the growth of synapses and which become strengthened

Our Brains



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Chemicals

- cortisol – stress hormone
- adrenaline – stress chemical
- opioids – sense of well-being
- oxytocin – comfort, safety

Traumatic Unsafe Childhood

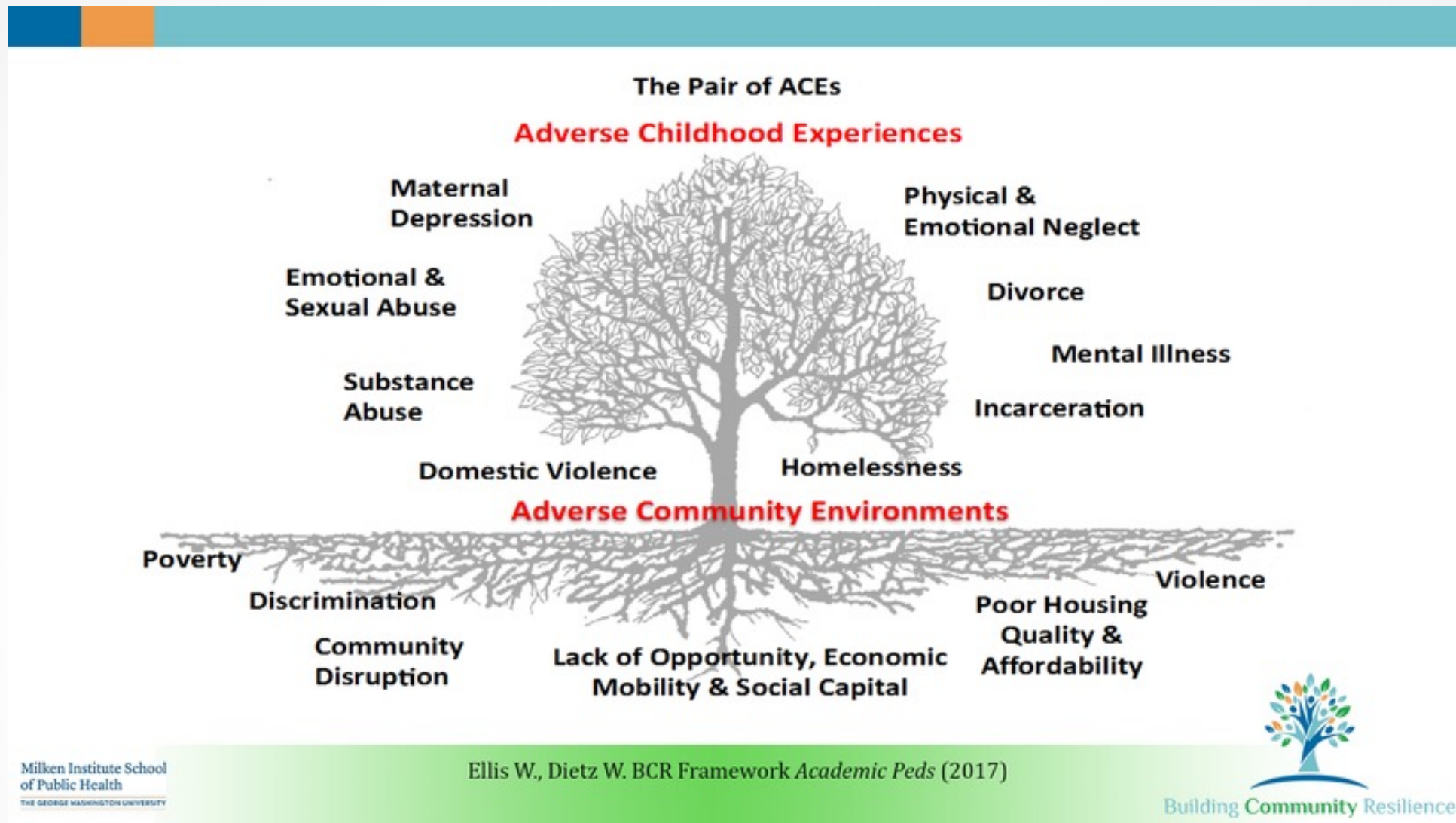
- reduced growth of synapses
- reduced connection between mammalian and thinking brain
- reactive to emotions, unable to self regulate
- rational thought is difficult
- no self awareness

Amygdala & Hippocampus

- amygdala – our receiver box, processes our emotions and assesses threat levels
- hippocampus - linked to our memories, as part of processing fear level by the amygdala the hippocampus will be accessed
- negative childhood experiences affect growth of amygdala and hippocampus
- biologically more likely to feel unsafe and hypervigilant

Adverse Childhood Experiences

- ACES harm children's developing brains, changes how they respond to stress, damages their immune systems so profoundly that the effects show up decades later.
- ACEs cause much of our burden of chronic disease, most mental illness, and are at the root of most violence.
- 10 identified ACES for the survey. 5 more ACES considered applicable now.



Why?

- Sympathetic Nervous System
- rapid involuntary response to dangerous stressful situations
- stimulates fight/flight/freeze response
- developed over thousands/millions of years

Sympathetic Response

Cortisol:

- our main stress hormone. It works with our brain to control our mood, motivation, and fear
- it fuels fight/flight/freeze response
- also regulates blood pressure, increases blood sugar, manages our sleeping cycle and boosts energy to help us manage stressful times

Sympathetic Response

Adrenaline

- another chemical produced in highly stressful situations, similar to cortisol - also linked to our fight/flight/freeze response
- causes our air passages to dilate to provide our muscles with the oxygen we need to either fight danger or flee
- triggers our blood vessels to contract to re-direct blood toward major muscle groups, including the heart and lungs
- our ability to feel pain also decreases as a result of adrenaline
- causes a noticeable increase in strength and performance, as well as heightened awareness

Long Term Impacts

Cortisol:

- short bursts of cortisol are ok and the body will return to normal afterwards
- constant production can lead to a number of health problems, including headaches, heart disease, digestive problems, sleeping difficulties

Adrenaline:

- continued surges of adrenaline can damage our blood vessels, increase our blood pressure, and elevate our risk of heart attacks or stroke,. cause headaches and insomnia and exacerbate anxiety.

Why is this relevant in education?

- it is not only physical threats that stimulate the threat response system
- perceiving a threat can trigger the response
- if we are feeling threatened we don't learn/function as best we can
- long term stress has physical implications

Sympathetic Nervous System Triggers....

Anytime we feel threatened including:

- anxiety
- stress
- bereavement
- illness
- illness/pain

Thought –conscious or subconscious can be a trigger.

Good News

Neuroplasticity:

“It refers to the physiological changes in the brain that happen as the result of our interactions with our environment. From the time the brain begins to develop in utero until the day we die, the connections among the cells in our brains reorganize in response to our changing needs. This dynamic process allows us to learn from and adapt to different experiences” – Celeste Campbell (n.d.).

Our Brains



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We need to provide environments that allow new pathways connections to grow and that ensure positive pathways remain open.

Parasympathetic Nervous System

Relaxes body once the emergency has passed:

- constricts pupils & increases lubrication
- stimulates saliva flow – easier digestion
- slows heart rate
- constricts bronchi – breathing slowed
- stimulates stomach, pancreas, intestines – promotes digestion
- stimulates bile release – allows body to digest fats
- contracts bladder – enables urination to occur

Vagus Nerve

- 75% of all parasympathetic nerves.
- Helps body relax faster after stress.
- The more you vagal tone is increased the more you mental and physical health will improve.
- Stimulating your vagal nerve improves your vagal tone.

Stimulating Your Vagus Nerve

- cold exposure/cold water
- deep and slow breathing (six breaths per minute/exhale longer than inhale)
- singing, humming, chanting, gargling
- connection
- meditation
- eating fibre
- physical activity
- massage
- socialising and laughing
- sugar

Positive Environments

- safe – physically and psychologically
- being heard and validated
- empathy
- positive norms and models
- self-esteem boosts
- supporting self-regulation

Positive Environments

- home
- sports
- forces
- fostering
- anywhere with positive relationships
- school/education

Research shows that one person can make a difference.

“For many children, connecting with just one adult is enough to end their deep sense of loneliness, isolation, feeling of not belonging or being understood.”

Sroufe et al, The Development of the Person, 2005

“You didn’t let me down Miss. You were the only one who believed me.”

Listening And Empathising

- **Children who are empathised with on a regular basis in childhood have a good vagal tone (calm body states), and do better academically, socially and emotionally.**

Gottman et al, “Do bullied children become anxious and depress adults?” (2006)

- **When people talk about their feelings, rather than pretending all is ok, their body and mind are calmer and more regulated.**

Lieberman et al, “Subjective responses to emotional stimuli during labelling, reappraisal, and distraction” (2011).

- **When people are in pain, an empathetic presence calms the body.**

Sambo et al “Knowing you care: effects of perceived empathy and attachment style on pain perception” (2010)

Positive Norms & Role Models

Social dynamics in the classroom : Teacher support and conflict and the peer ecology

- “Our findings support the notion that the teacher functions as a model or social referent for students regarding how to interact and form relationships with others. When teachers are aware of this, they can deliberately use their everyday interactions with students as network-related teaching strategies.”

Hendrickx, Marloes M H G; Mainhard, M. Tim; Boor-Klip, Henrike J.; Cillessen, Antonius H M; Brekelmans, Mieke
(2016) Teaching and Teacher Education, volume 53, pp. 30 – 40 (Article)

Teaching Staff Affect Social Dynamics

Further Support for the Developmental Significance of the Quality of the Teacher–Student Relationship

- Classmates make inferences on other attributes and likeability based, in part, on observations of teacher interactions.

Journal of School Psychology 39(4):289-301 · July 2001 Jan N Hughes, Timothy A Cavell, Victor L Willson

Teaching practices and elementary classroom peer ecologies

- Teachers who showed high level of general emotional support to all students had classrooms with more reciprocated friendships.

Scott D.Gest, Philip C.Rodkin

Question/Comments?

Recommended Further Reading

- What Every Parent Needs to Know: The incredible effects of love, nurture and play on your child's development – Margot Sunderland
- Brain-Based Parenting – Daniel Hughes & Jonathan Baylin
- Mental Health in Education – Samantha Garner

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Sam Garner

Mental Health & SEND trainer,
Keynote speaker, Author



Delivered by:

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