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The Neuroscience of Restorative Justice *A Path to Healing and Rehabilitation*

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Meet Jeffrey

- Jeffrey had a **troubled childhood**, marked by **isolation**, **parental conflict**, which often left Jeffrey **feeling isolated and neglected**.
- As a child, Jeffrey was **shy and withdrawn**, often **showing little interest in socializing with others**.
- By the time he reached his **teenage years**, he became increasingly isolated, spending much of his time alone
- One particularly disturbing aspect of his childhood was his **fascination with dead animals**.
- Jeffrey was known to collect roadkill, dissect it, and store animal bones, an early sign of his morbid curiosity with death and the human body.

This behaviour was largely ignored or overlooked by adults around him, though it was an indicator of his future violent tendencies.

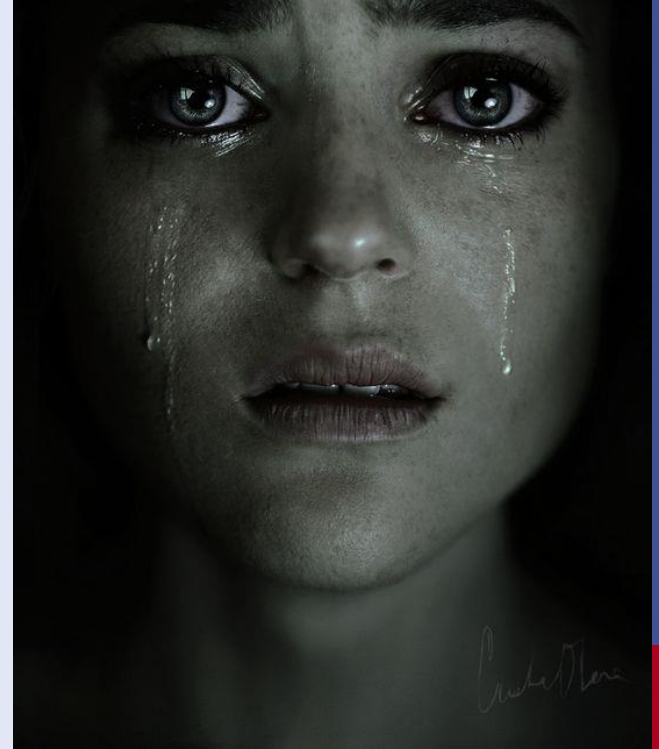


Jeffrey Dahmer

What drives criminal behaviour?

Psychopathy is characterized by anti-social behavior

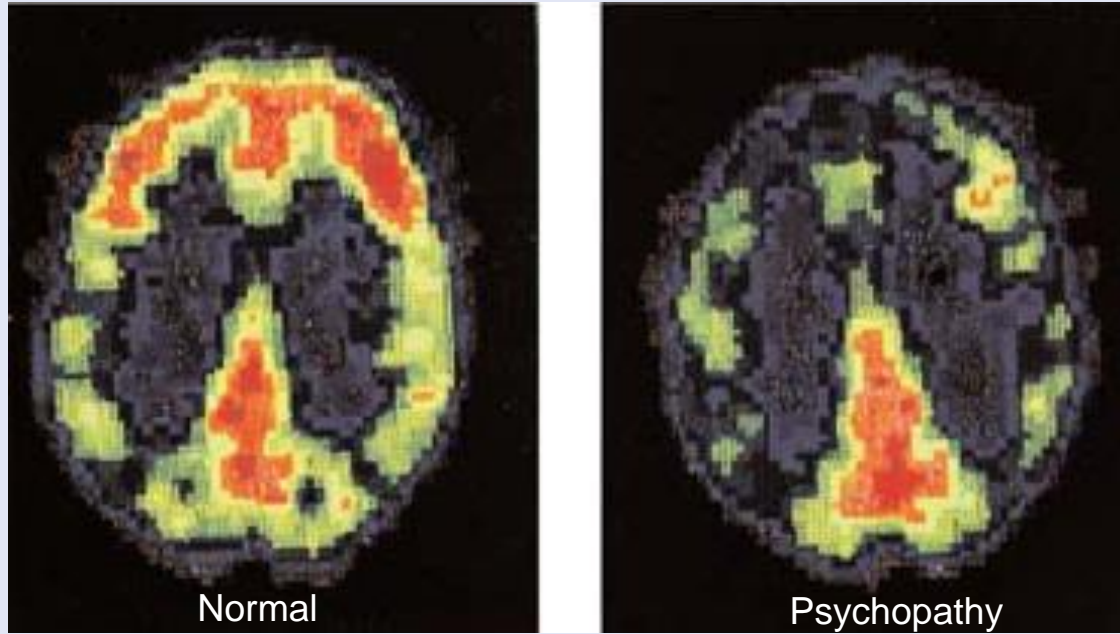
- **Unstable relationships** due to:
 - Blunted capacity for experiencing and understanding emotions (Kosson, Suchy, Mayer, & Libby, 2002)
 - Good ability to categorise different images of emotions
 - But no indication of physical response to the emotions
 - Nonverbal signs, including **facial expressions** (Blair, Colledge, & Mitchell, 2001; Blair et al., 2004)



They can name the emotion but cannot feel it – Missing empathy!!!

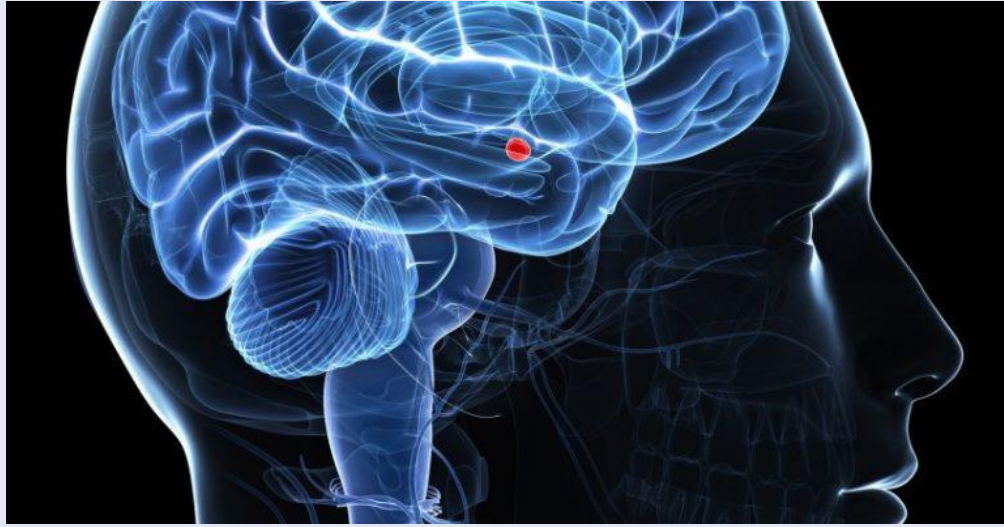
Neuropsychological dysfunction – Frontal lobes

(review by Yaralian and Raine, 2001)



Such deficits increase risk for psychopathy because they make it challenging for individuals to associate acts of harm and aggression with unpleasant negative arousal or reactivity to others' fear/distress, increasing the likelihood of continued harm against others or crime (Blair, 2001; Lykken, 1957).

Damage in a brain area called the Amygdala (Waller et al., 2019)



The amygdala is an almond shaped organ deep within each of the hemispheres of the brain and they are thought to be key to the experience of **Empathy**

Adults high on psychopathy exhibit reduced amygdala reactivity in response to others' cues of fear (Kiehl et al., 2001; Rilling et al., 2007)

Acquiring moral behaviour

- Children learn empathy both from watching us and from experiencing our empathy for them.
- empathy is inborn.



Designing a Virtual Reality Game for Promoting Empathy (Tong et al., 2019)

The findings of this study suggest that the VR game was effective in improving implicit and explicit empathy as well as its emotional subscales of:

- The kindness scale
- Willingness to help scale

Can we change serial Killers?

Can we help criminals build empathy?



Can Brains Change?

You cannot learn something without storing it in some form of memory for future use.

*From neuroscience, we know that memories are encoded **by physical changes in the brain.***

*In other words, your brain changes physically whenever you learn anything, and your brain **continues to be moulded** by experience and learning throughout your life.*

- Brain is **never fixed** but continues to **change** throughout your life.
- Most learning in the brain involves **rewiring or making and strengthening connections** between neurons,
- **Neuroplasticity** is important for all learning



Neurogenesis

Traditional Understanding of the Brain:

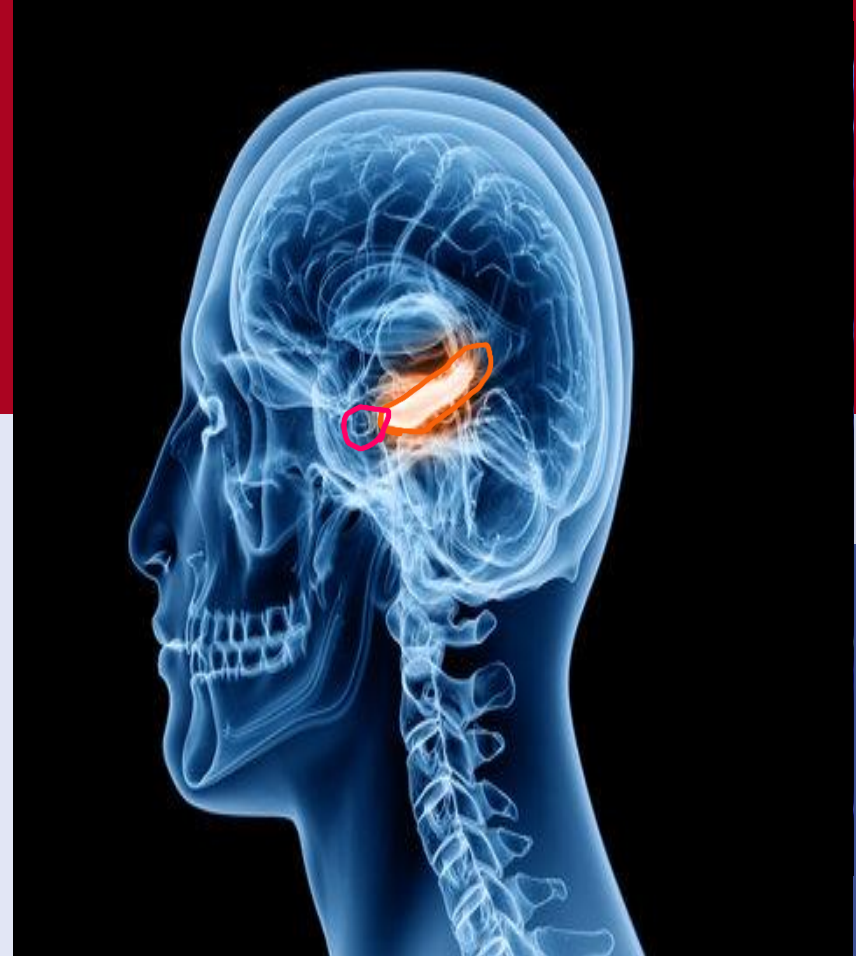
- The majority of the brain's neurons are present from birth.

Neurogenesis in the Hippocampus

- One small but important area of the brain continues to grow new neurons throughout life, called the **hippocampus** (memory and learning).

Scientific Findings:

- They estimated that around **700 new neurons** are added to each hippocampus (left and right) **every day**.
- By the age of 60, approximately **one-third of the neurons** in the hippocampus are new, formed after birth through neurogenesis (Spalding et al., 2015)



The more stress, the less brain development (Shin et al., 2023)

Standard Cage Conditions:

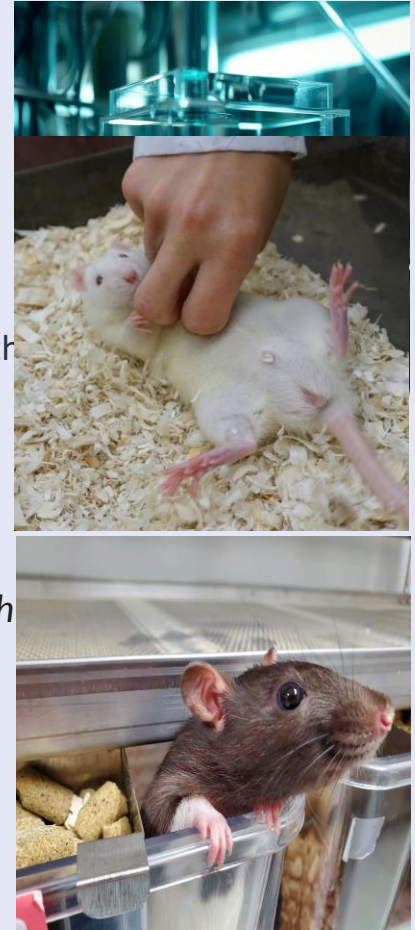
- Mice kept in basic cages with limited stimulation tend to struggle.
- Social instincts diminish, leading to:
 - Higher aggression when encountering other mice.

Enhanced Living Conditions:

- Mice raised in stimulating environments have:
 - Access to diverse resources like food, spacious living areas, exercise wheels with opportunities to socialize and engage in play with other mice.
- These mice show the growth of new brain cells, suggesting that a rich environment supports healthier brain and behavioral development.

In human early life is a period sensitive and vulnerable to environmental influences, such as stress, and the negative influences of early life impact later life (Hedge and Mitra, 2020).

More stress, less brain development and less adaptability – Interplay between nature and Nurture



Prisons - Inhibition of any change of brain development

Irony in Criminal Rehabilitation:

- Prisons often create an environment that causes **stress to the amygdala**, inhibiting **brain development** and personal growth.

Imprisonment and Society:

- Imprisonment is a **necessary part of the criminal justice system** and important for protecting society.

The Case for Rehabilitation:

- One way to offer rehabilitation is through **restorative justice programs**, which encourage personal growth and accountability.



Restorative Justice – Victims Participation

Restorative justice **provides a platform** for individuals affected by crime and harmful behaviour to **have a dialogue with the perpetrator**.

- It grants victims the chance to express their grievances, articulate the impact it has had on them, and suggest ways to rectify the situation.
 - **Perpetrator is encouraged to take responsibility of their action**
 - **Victim place an active role** in the process.
- In this case the perpetrator can see the victim as a real person, with **thoughts and feelings and a genuine emotional response**.
- This stimulates the amygdala and the hippocampus creating a new memory, a new learning. Maybe this could be a more effective rehabilitative practice than incarceration?



Conclusion: A brighter future for Justice

"Restorative justice is not just about healing the victim, but about transforming the system into one that heals all who are touched by crime."



Thanks!

Do you have any questions?

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