

Presentation Felix Schirmann

SLIDE 2

The year is 1885. The place: Ontario, Canada. The patient:

William Bigg clearly was an immoral person. From an early age, Bigg slashed the throats of horses and on several occasions tried to kill his siblings.

His behavior was so bad that his parents had to lock him in the shed at night.

As an adult: He lied, stole, was prone to violence and even raped.

Bigg was institutionalized and his doctor, the then famous Daniel Hack, surmised that he was suffering from a rare mental disorder: moral insanity; which had its roots in a disordered brain.

Accordingly, Bigg was not criminal, but sick. In the doctor's view, William Bigg's brain made him behave immorally.

SLIDE 3

Fast forwarding for approximately 50 years and crossing an ocean... We are in the Weimar Republic. The First World War has flooded the hospitals with patients with head wounds. Among them, was a group of former soldiers who behaved immorally: They lied, stole, cheated – and most strikingly did not respond to punishment. Many of these men had suffered a destruction of a specific region in the frontal part of the brain right above the eyes, the so-called orbito-frontal cortex. Such as this patient, named Iberger, who was wounded by shrapnel. His doctor, Karl Kleist, then a famous neuropathologist, found an explanation for his patient's bad behavior: His moral center in the brain was destroyed. Kleist believed he had found a region that contained: "fidelity, gratefulness, helpfulness, friendship and hostility, mistrust and spitefulness, need for recognition, imperiousness and obedience" in short: morality; seated right above the eyes.

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Fast forward again...

Until the 1930s, research on morality in the brain by and large relied on autopsies (dissecting dead brains) and lesion studies (such as the ones conducted by Kleist), this changed dramatically in the 1940s. Electroencephalography - the recording of the brains electrical activity – became available. Soon scientists searched the brain waves of murderers, criminals, and psychopaths for abnormal features.

They were looking for an „evil brain wave“ – however, their hopes were disappointed. The visualization of brain-based immorality with the new technology failed. However, in recent years another technology sparked a new hope that good and evil might become visible in the brain.

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A giant historical leap towards the present: In 2009, the already convicted rapist and murderer, Brian Dugan stood trial again for the killing of a girl.

A neuroscientist put Dugan in a brain scanner and testified that Dugan's neuronal activation patterns resembled those of other

Psychopaths, thereby suggesting that Dugan's brain made him commit his crimes and that he could not be deemed fully responsible for his acts.

The jury deliberated for ten hours and then decided unanimously: Dugan was found guilty and was sentenced to death.

Yet Dugan's defense attorney, Steve Greenberg said that "Without the brain imaging stuff the jury would have been back within an hour." So the neuroscientists evidence left a controversial impression on the jury.

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Keeping the four stops of our time travel in mind: What can be learned from the long and complicated history of the neuroscience of morality?

- We see that the employed mental disorders concepts change over time; e.g. late 19th century moral insanity is very different from modern day psychopathy
- We learn that the cerebral locations for morality are transient. Whereas Karl Kleist located morality exclusively in the frontal part of the brain, modern neuroscience identified a „moral neural network“ distributed over the entire brain
- Lastly, we learn that the methods and technologies applied change and influence how morality is deemed to be materialized in the brain. So there has been an evolution from the alleged immoral brain waves of the 1940s to the modern brain images of good and evil.

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Considering a simplified media adaptation of such a brain image of good and evil; we can ask: Has history come to an end?

Has modern neuroscience pinpointed morality in the brain? And can neuroscience determine whether a person will behave like Ghandi or Hitler, respectively?

The answer is: NO. More than 200 hundred years of scientific research on morality in the brain have yielded interesting, yet tentative and controversial findings. Accordingly, morality still lies hidden in the convolutions and furrows of the brain and neuroscience's search for it continues.

With this final statement, I'd like to end my presentation and express my gratitude to my supervisors, Trudy Dehue and Stephan Schleim, to my former colleagues at the chair for Theory and History of Psychology in Groningen, and of course, to the Stichting Praemium Erasmianum for awarding this price to my dissertation. I am deeply honored. Thank you.