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Anxiety, Cortisol, and Violent Behavior

[Ed: It's always good to see 'the mainstream' picking up on the truth, although admittedly it's a big step from what's discussed here to the realization that almost everyone is "neglected and traumatized"]

Science: Can we stop Anti-Social Behavior?

One of the Daily Telegraph's [UK] charities is conducting pioneering research into the causes of anti-social behavior.

Is violence in fact a symptom of a sick or underdeveloped brain? This question is at the heart of a new project launched by Camila Batmanghelidjh, the founder of Kids Company. She takes an imaginative approach to improving the lives of neglected and abused children.

Her organization, which works across London and is one of The Daily Telegraph's chosen charities for this year's Christmas appeal, started a pilot scheme this month to examine the brains and behavior of young offenders, in order to help understand how they think.

Their discoveries: Lack of affection in childhood can lead to stunted physical growth and mental abilities.

"Neglected and traumatized children do not appraise a situation objectively, " Camila says. "They don't come to the point of a moral decision with a neutral frame of mind."

Over the course of the project, which is being carried out with the help of Professor Faraneh Vargha-Khadem, of Great Ormond Street Hospital for Children and the University College London Institute of Child Health, 10 boys aged between 11 and 14 will be evaluated for their predisposition towards anti-social behaviour, along with their intellect, cognition, academic attainments and emotional status.

Then they will lie down in a scanner so that doctors can examine key brain areas, such as the prefrontal cortex, for abnormalities. "This is the first time this kind of study will be done," says Dr Humam Maki, who does research for Kids Co.

The brain scans will offer a new way of revealing the effects of exposure to chronic stress in violent and emotionally disturbed children.

One project, carried out in a Romanian orphanage by Prof Mary Carlson, of Harvard Medical School, suggested that lack of physical affection could cause an abnormal release of cortisol, the anxiety hormone that stunts mental abilities. Many diseases of the mind are also associated with changes in levels of this hormone, and in those of the neurotransmitter serotonin.

Prof Terrie Moffitt, of the Institute of Psychiatry in London, carried out a study of 442 men. This found that 85 per cent of those who had been maltreated as children, and had a gene associated with low activity of an enzyme called MAOA, were much more likely to have demonstrated anti-social behaviour, such as convictions for violent crime.

But children expressing a gene corresponding to high MAOA activity were less likely to be anti-social, even if they had been maltreated.

In parallel, there has been a revolution in understanding what goes on in the minds of violent people. There is strong evidence that they have poorer functioning in the parts of the brain involved in regulating and controlling emotion and behavior; showing an 11 per cent reduction in the volume of grey matter (the neuron cell bodies) in the prefrontal cortex [N6].

Over the past decade, evidence has emerged that the prefrontal cortex and mid-networks should put into perspective the more instinctive and primitive brain areas, enabling us to cope with perceived stress, worry and threat.

At the heart of this process [in Network 3] are the amygdalae, two almond-shaped structures on either side of the brain that should help us handle our emotional experience and memories. Through connections to other regions, they influence the production of stress hormones that help us deal with threats, but which in excess play a role in aggression, impulsive behavior and

violence.

These visceral feelings can still be calmed by signals from the prefrontal cortex, which (should be) gradually maturing from early childhood. But the way this region matures can be impaired in a child who has experienced violence, deprivation of input or neglect.

Brain scans, Dr Maki reveals, have shown "dramatic differences" between individuals. If the prefrontal cortex is relatively underdeveloped, it is thought that overactivity of the more primitive brain regions will predispose these people to a pattern of violence and/or paranoia.

These emotionally disturbed people are more on edge, defensive, insecure and aggressive. Doctors speculate that their hyperactive amygdalae will predominate over their frontal neural responses if front networks are sparse, so they misread everyday events, gestures and events as threatening.

For example, a friendly touch could be interpreted as an antecedent to seduction and rape; and many traumatized individuals interpret neutral facial expressions as a sign of imminent attack.

Even staring into someone's eyes can be a danger signal: research has shown that seeing the whites, or sclera, of another person's eyes triggers an automatic fear response just 12,000ths of a second before we are conscious of it, probably because there is a direct connection between the retina and the amygdalae.

Doctors hope that the dominance of inner, primitive centres over the more thoughtful cortical circuits can be altered with use: Dr Maki likens the brain to a muscle, in that regions can be trained and improved.

Provide a loving, caring, sympathetic and consistently non-anxious environment, and you can build up the prefrontal cortex, and help a persistent offender to become less anxious and more thoughtful.

Kids Company, which works with about 12,000 inner-city children and others ranging in age from three to 23, already has many successes in this respect. Dr Maki says their help ranges from psychiatry to providing a caring environment.

But the field still cries out for more systematic study to determine the best approach. This is where the pilot project to reveal brain anatomy and structural abnormalities comes in. By investigating serious anti-social behavior, the research team hopes that markers of dysfunction and disorder can be identified in the brain to guide future diagnosis and management.

Within a few years, this pioneering project could have laid the foundation for new ways to turn people away from violence.

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Escrito por NHA

Viernes 12 de Junio de 2009 22:27 - Última actualización Viernes 02 de Agosto de 2013 18:45

Sources

Daily Telegraph UK Nov 2007