



CSI, Science

Where neuroscience meets criminology

In his best-selling essay entitled “Guns,” Stephen King contrasts a mass killer’s school yearbook picture, “in which the guy pretty much looks like anybody,” and the police mug shot of someone who looks “like your worst nightmare.”

Do criminals look different from noncriminals? Are there patterns that science can discover to enable society to identify potential felons before they break the law or to rehabilitate them after? University of Pennsylvania criminologist and psychiatrist Adrian Raine attempts to answer these and related questions in his book *The Anatomy of Violence: The Biological Roots of Crime* (Pantheon, 2013). Raine details how evolutionary psychology and neuroscience are converging in this effort. For example, he contrasts two cases that show new ways to look at the origins of wrongdoing. First is the example of “Mr. Oft,” a perfectly normal man turned into a pedophile by a massive tumor at the base of his orbitofrontal cortex; when it was resected, he returned to normalcy. Second, we learn of a murderer-rapist named Donta Page, whose childhood was so horrifically bad—he was impoverished, malnourished, fatherless, abused, raped and beaten on the head to the point of being hospitalized several times—that his brain scan “showed clear evidence of reduced functioning in the medial and orbital regions of the prefrontal cortex.”

The significance of these examples is revealed when Raine

reviews the brain scans he made of 41 murderers, in which he found significant impairment of their prefrontal cortex. Such damage “results in a loss of control over the evolutionarily more primitive parts of the brain, such as the limbic system, that generate raw emotions like anger and rage.” Research on neurological patients in general, Raine adds, shows that “damage to the prefrontal cortex results in [increased] risk-taking, irresponsibility, and rule-breaking behavior,” along with personality changes such as “impulsivity, loss of self-control, and an inability to modify and inhibit behavior appropriately” and cognitive impairment such as a “loss of intellectual flexibility and poorer problem-solving skills” that may later result in “school failure, unemployment, and economic deprivation, all factors that predispose someone to a criminal and violent way of life.”

What is the difference between an aggressive tumor and a violent upbringing? One is clearly biological, whereas the other results from a complex web of biosocial factors. Yet, Raine points out, both can lead to troubling moral and legal questions: “If you agree that Mr. Oft was not responsible for his actions because of his orbitofrontal tumor, what judgment would you render on someone who committed the same act as Mr. Oft but, rather than having a clearly visible tumor, had a subtle prefrontal pathology with a neurodevelopmental origin that was hard to see visually from a PET scan?” A tumor is quickly treatable, but an upbringing—not so much.

We also need an evolutionary psychology of violence and aggression. “From rape to robbery and even to theft, evolution has made violence and antisocial behavior a profitable way of life for a small minority of the population,” Raine writes. Theft can grant the perpetrator more resources necessary for survival and reproduction. A reputation for being aggressive can grant males higher status in the pecking order of social dominance. Revenge murders are an evolved strategy for dealing with cheaters and free riders. Even child murder has an evolutionary logic to it, as evidenced by the statistic that children are 100 times more likely to be murdered by their stepfather, who would have an interest in passing on his own genes over a rival’s, than their natural father.

An evolutionary psychology and neuroscience of criminology is the next and necessary step toward producing a more moral world. In Raine’s concluding remarks, he exhorts us to “rise above our feelings of retribution, reach out for rehabilitation, and engage in a more humane discourse on the causes of violence.” Although some people may balk at the biological determinism inherent in such an approach and others may recoil from the preference for rehabilitation over retribution, we can all benefit from a scientific understanding of the true causes of crime. ■

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