

Should We Screen Kids' Brains and Genes To ID Future Criminals?

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Intervention might help save troubled kids. But the label could doom them.

This article arises from Future Tense, a partnership of Slate, the New America Foundation, and Arizona State University that explores emerging technologies and their implications for public policy and for society. On Monday, Oct. 22, Future Tense will host "My Brain Made Me Do It," an event in Washington, D.C., on how the legal system will adapt to changes in neuroscience. For more information and to RSVP, or to watch the live stream, visit the New America Foundation's website.

If you read judicial opinions in serious crime cases, which always seem to describe every gruesome and salacious detail, you will almost surely reach two conclusions. First, no "normal" person could ever commit many of the horrific acts described in those cases. Second, everyone involved would be so much better off if we could have somehow anticipated and prevented those crimes from occurring in the first place. The perpetrators themselves might be leading normal lives if their violent tendencies were identified and treated before they committed their crimes. Even more importantly, the innocent victims, as well as their loved ones, would, it goes without saying, greatly benefit from not having been murdered or assaulted.

The idea that we could prevent crime by identifying and treating minors predisposed to violent behavior has long been contemplated and debated. Leon Kass, who would later chair President Bush's Bioethics Commission, wrote in *Science* in 1971 that while he served in the federal government in the 1960s a proposal was "tendered and supported high in government" that called for the psychological testing of all 6-year-olds in the nation to detect "future criminals and misfits." The proposal was rejected because the then-available tests of future criminal behavior lacked sufficient predictive accuracy. But in the future, asked Kass, "will such a proposal be rejected if reliable tests become available?"

We are now reaching a critical juncture where scientific developments in both genetics and neuroscience may soon be able to identify children with a greatly increased risk of engaging in future violent activity. In the genetics field, mutations in the MAOA gene, in combination with an abusive upbringing in the early years of life, substantially increase the risk of future antisocial and violent conduct. In the original study by Avshalom Caspi and colleagues, 85 percent of males who had the mutated form of the MAOA gene, combined with severe mistreatment in the early years of life, engaged in some form of antisocial behavior, whereas fewer than 20 percent of children with the normal MAOA allele and the same abusive environment engaged in such behavior. This type of study with the MAOA gene has been repeated many times now, with most (although not all) of the follow-up studies replicating the original findings.

To date, the genetic risk associated with MAOA mutations has been used in the legal system primarily as mitigating evidence (with only limited success to date) to reduce the sentence of a criminal with the genetic predisposition. Obviously, in these cases, the crime has already been committed. But perhaps we could look for that genetic marker before any crime is committed—and there are other potential red flags we can look for as well. For instance, Dr. Adrian Raine of the University of Pennsylvania found that a brain abnormality (called cavum septum pellucidum) detected in the fetus was associated with subsequent antisocial behaviors. Another study found that poor fear conditioning (which is the anxiety most of us learn to feel when we do something antisocial) at age 3, indicative of amygdala dysfunction, predisposes individuals to crime at age 23. Yet another study used

functional MRI to identify brain patterns correlated with increased impulsivity in incarcerated juveniles. This is just a small sampling of a growing body of experimental findings linking neurological traits with criminal propensity in children.

Such tests are never likely to be deterministic or completely accurate. They will identify only increased probabilities of violent behaviors, not certainties. But before we get much further down this road, we need to start thinking about whether and how we want to use this capability to identify at-risk children.

There are many obvious detriments and risks in trying to identify such children. First, the data we have are based primarily on group averages, and when applied to individuals, they will result in both false positives and false negatives. Second, there is a long history of eugenic and racist attempts to use biological characteristics to discriminate, creating understandable concerns about going down that road again. Third, tagging a child as a potential future criminal will have many kinds of detrimental psychological impacts for that child and those who interact with him. Fourth, there will undoubtedly be privacy and confidentiality concerns and breaches regarding individuals' test results. Perhaps the most critical question is, what do we do with such children when we identify them?

Given the serious potential risks and consequences associated with trying to detect at-risk children through their genetics and/or neuroscience, it seems that such efforts would only make sense, if at all, if there were effective strategies to treat such children to prevent their violent futures. Happily, there are some early indications that this may be feasible. For example, one study found that enriching the environment of at-risk children aged 3-5 years with better nutrition, more physical exercise, and intellectual stimulation reduced criminal offenses at age 23 by 34 percent. A growing body of studies is showing that social, behavioral, nutritional, or pharmaceutical interventions can reduce the antisocial or violent behavior of at-risk youths.

As potential treatments and other strategies are identified, however, we will need concerted research programs to test those ideas on children identified to be at risk for future violence. Such studies will have to be designed and implemented carefully to avoid or minimize stigmatization and privacy pitfalls. Moreover, the children included in these studies shouldn't be identified by mass screenings at school, but by aberrant behavior, followed by genetic or neurologic testing.

Critics of such biology-based preventive approaches emphasize that the environment also plays a critical role in ultimate behavior. But that is the point. By favorably altering the environment of biologically predisposed children, we may be able to avoid the horrific outcomes that would otherwise result. This is not a Minority Report-like future in which would-be criminals are caught and arrested before committing their crimes, but rather using new technology to identify at-risk kids and treat them before they inflict irreparable damage on themselves and others. As Penn's Raine has put it: "[I]f I could tell you, as a parent, that your child has a 75 percent chance of becoming a criminal, wouldn't you want to know and maybe have the chance to do something about it? ... We have to start having this conversation now ... so we understand the risks and the benefits. It's easy to get on your moral high horse about stigma and civil liberties, but are you going to have blood on your hands in the future because you've blocked an approach that could lead to lives being saved?"

There are a number of people alive today, including young children, whose lives are destined to be horribly destroyed by individuals with broken brains. Some of those future victims—maybe even perpetrators—could be in your family or mine. If we could identify and successfully treat just some of the at-risk individuals predisposed to conduct such acts, we could save the victims and their perpetrators from reliving the nightmarish scenarios all too common in our criminal courts today.

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