

Kent Kiehl's Search for the Criminal Brain  
*America's self-proclaimed "psychopath whisperer" says he can  
predict criminality in incarcerated people. Is the legal system buying it?*

By

Sarah Rebecca Hopkins

Master of Studies in American Studies  
University of Oxford, 2011

Bachelor of Arts in Liberal Arts  
Sarah Lawrence College, 2010

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Authored by: Sarah Hopkins  
Program in Comparative Media Studies/Writing  
May 20, 2024

Certified by: Angela Saini  
Adjunct Professor, Graduate Program in Science Writing  
Thesis Advisor

Accepted by: Seth Mnookin  
Director, Graduate Program in Science Writing

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ABSTRACT

Since the 19<sup>th</sup> century, researchers have attempted to uncover the biological roots of criminality. The process has been both scientifically dubious and ethically fraught. While biological theories of criminal behavior faded after World War II, they arose again in the 1990s and early 2000s, when new brain imaging techniques collided with a growing interest in understanding how biological drivers of crime, if they exist, could be analyzed to understand, and even predict, criminal behavior. This thesis examines the research and claims of a prominent neuropsychologist within that historical context. He claims to have conducted promising brain research on incarcerated people that could uncover biological markers of criminal behavior, or even predict future criminality. Yet methodological and ethical questions have been raised about his research. Is it scientifically valid to have a brain-based view of criminal behavior? Is it ethically valid to assume that criminal behavior can be decoded from the brains of people incarcerated in a system that disproportionately impacts people of color and those from low socio-economic backgrounds? His critics are doubtful.

Thesis supervisor: Angela Saini  
Adjunct Professor, Graduate Program in Science Writing

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“I don’t care about dying,” Brian Dugan said on a videotape broadcast to a suburban Chicago courtroom in 2009. “I’ll have an early release.”

A jury was deciding whether to sentence Dugan to death for the rape and murder of a 10-year-old girl. In 1985, two local men, 19-year-old Alejandro Hernandez and 20-year-old Rolando Cruz, had been wrongfully accused and sentenced to death for her murder. In 1995, the state reversed their convictions when it was revealed that prosecutors had introduced faulty evidence at their criminal trials, and that the court had excluded evidence indicating that Dugan had committed the crime.

On the videotape, the man that Dugan had been speaking to was Kent Kiehl, a neuropsychologist from the University of New Mexico who specialized in the study of psychopathy in incarcerated people. Kiehl had been summoned as the defense’s star witness, to answer a question that lay at the heart of the hearing: Was Dugan a psychopath?

Dugan had confessed to the murder in 1985, while he was already serving a life sentence in state prison for the rape and murder of two women. DNA evidence later established that Dugan had been at the crime scene.

But, were a brain scan to identify Dugan as psychopathic, his attorneys could argue in court that Dugan should not be sentenced to death because he was not emotionally capable of sensing right from wrong or of caring about the difference. It was a desperate strategy, based in controversial science, to move Dugan’s case beyond “a slam dunk for the prosecution,” in the words of his attorney.

Kiehl had the answer that Dugan’s defense wanted. He tested Dugan for psychopathy the same way he had tested over 1,000 incarcerated people before. He interviewed Dugan for hours, applying his answers to a psychopathy screening checklist, along with information from Dugan’s correctional files. Kiehl also scanned his brain using what was at the time a new technique, called functional magnetic resonance imaging (fMRI).

During fMRI scans, participants lie inside a tunnel-shaped machine that uses magnets to detect oxygen in the blood flow of their brains as they view images or listen to sounds. The flow of oxygen is thought to represent brain activity, allowing researchers to map which brain regions are activated in response to the images or sounds.

Kiehl scanned Dugan as he was shown pictures designed to provoke emotional responses, like a man yelling at a child or a surgical procedure, to assess how those responses, if any, stimulated his brain.

Kiehl told the jury that Dugan's score on the psychopathy checklist placed him in the 99<sup>th</sup> percentile—one of the highest psychopathy scores he had ever recorded. He testified that Dugan's scans showed the same patterns of atrophy in the brain's emotional control centers that had been observed in other psychopaths. His testimony made national news. "Dugan's brain focus of testimony," read one headline. "Strange mind of a killer: Researcher says Dugan rare psychopath," read another.

It was one of the first US court cases to admit brain scans as evidence.

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Since the Dugan trial, Kent Kiehl, now 54, has continued his quest to identify what, on a neurological level, makes a person commit criminal violence. Today, he researches ways to predict who might be prone to criminal behavior even before committing a crime. The idea is to provide law enforcement with more evidence-based techniques to decide who should be released from prison. Kiehl also searches for psychopathy treatments, he says, to prevent people from committing crimes in the first place.

His critics have questioned his methodology and the ethics of his line of inquiry. Is it scientifically valid to have a brain-based view of criminal behavior? Is it ethically valid to assume that criminal behavior can be decoded from the brains of people incarcerated in a system that disproportionately impacts people of color and those from low socio-economic backgrounds? His critics are doubtful.

Sociologist Oliver Rollins, who has studied Kiehl's research alongside that of other "criminal brain" researchers, says that using the brain to predict who is prone to violence in American society is fraught with ethical issues. This is because it is a line of scientific inquiry that is fundamentally connected to social influences, like racism and poverty. Black, Latino, and Native American people are disproportionately incarcerated in the United States, as are people from impoverished backgrounds. Yet such research remains unable to account for those factors, Rollins says.

According to Rollins, few researchers who study the brains of the incarcerated will engage with his questions about the racial disparities in who is policed and incarcerated in America.

"So many of these researchers don't want to go on the record to talk about ethical issues because they feel that they're going to be painted as either racist or sexist or deterministic," he said. "But of course, that raises another kind of red flag. If you're not going to engage in these kinds of ethical questions, then how do we make sense of the ethics of this particular type of work?"

Yet, for more than 15 years, Kiehl's "criminal brain" research has held appeal for legal scholars and has attracted millions of dollars in funding.

In a widely publicized 2013 study supported by the MacArthur Foundation, Kiehl and his co-authors wrote that brain activity in the anterior cingulate—a frontal portion of the brain that may help to drive cognitive functions like empathy, impulse-control, and emotion—from a sample of 96 people who had been released from prison "predicted subsequent rearrest among adult offenders within 4 years of release."

They followed up with another study in 2018, in which they claimed that brain age and activity within specific brain regions of 1,332 incarcerated adults and children predicted subsequent rearrest, in most cases, within 5 years of release.

"Essentially, what we did is we scanned a whole bunch of inmates, and then followed them for five years. Those who reoffended were compared to those who didn't reoffend," Kiehl tells me during

one of three lengthy phone interviews between November 2023 and February 2024. “It got a lot of media attention saying that I can read your brain scan and tell you who’s going to reoffend or not.”

Eyal Ahroni, a psychology researcher at Georgia State University who collaborated on these studies, describes Kiehl’s statements to the media more as a form of marketing than as a reflection of the state of the scientific research. “You need some people to be sort of leading the marketing of the science so that we get the funding to do the work,” he says.

In response to his critics, Kiehl says that his work is peer-reviewed and publicly funded by the National Institutes of Health. He says his work goes through a rigorous ethical review process. According to data from the National Institutes of Health, he has received over \$30 million dollars from the agency since 2005.

Kiehl analyzes the brains of people incarcerated in the New Mexico and Wisconsin prison systems. (He hopes to expand his research beyond those states.) He is one of few remaining contemporary scientists who concentrate their research on the incarcerated.

“A lot of people just don’t do that,” he says. “For whatever reason, I just have no problem with it.”

“I just love it,” he says about his research. He likes to talk about the many occasions on which he has sat across from an incarcerated person and identified them as a psychopath. “They’re so completely and utterly and totally different than the rest of us,” he says. “You’re just left with this total shock.”

During our interviews, Kiehl describes himself as an iconoclastic researcher who dares to meet intimidating people in the forbidding environment of a prison. “Most of my peers in this field that study psychopathy have never actually met [a psychopath]. They’re never going to go into a maximum-security prison. They never could, they just wouldn’t,” he says. “It’s because it’s scary.”

In our first conversation, Kiehl says that providing brain scans to incarcerated people is basic healthcare, to make sure they don’t have brain injuries. Though he notes that many states do not want

to pay for such an expensive procedure. He adds, "I mean, it's just a waste of money. I think we should just lock them up for life. But then we wouldn't have all these fun things to talk about."

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In 1974, young women began disappearing from Washington State. Their disembodied remains were later found scattered across the state of Utah. In 1989, Ted Bundy confessed to these and 26 other murders, making him one of the most prolific serial killers in American history.

Bundy's story haunted Kiehl's childhood. He grew up about a mile from Bundy's home in Tacoma, Wash. Kiehl's father, a reporter and news editor, covered Bundy's criminal trial for the local paper. The story became part of the local lore, Kiehl says; his friends refused to go anywhere near the areas where Bundy had murdered his victims.

He also remembers the story of Gary Ridgway, known as the "Green River Killer," who was convicted of murdering 49 people in Washington state during the 1980s and 1990s. "Where I grew up, there was this fear. And I just remember, you know, that there was just no one who studied them," Kiehl says, speaking of serial killers. The mystique of these stories and their proximity to his community sparked his fascination with the human capacity for dark and sadistic behavior.

In one of our conversations, Kiehl tells me he was born to a 16-year-old mother. He says he spent the first two years of his life in an orphanage and that he was adopted by a Catholic couple in Tacoma who had three daughters. He learned of his adoption at around age 12, he says, while on a family vacation in Phoenix, Ariz. His sister blurted out the truth during a fight. Until that moment, Kiehl had no idea he was not biologically related to the family he'd always known.

"My parents said, 'When I adopted you, you were my son, and I never treated you otherwise,'" he says. Nonetheless, for a while, the experience violated his sense of trust. Kiehl was so shocked that he ran away. "It definitely was a good excuse for some juvenile delinquency."



He roamed the streets of Phoenix for a couple of days before the police found him. They tracked him down because several of his cousins worked for the police department. But he remained close to his adoptive parents, whom he describes as very loving. He admired his adoptive father, in particular, who he says sparked his inspiration to study psychopathy.

Kiehl first had the opportunity to study people who had committed crimes as an undergraduate student in psychology at the University of California, Davis. As Kiehl tells it, his advisor, Debra Long, for whom he worked as a teaching assistant, encouraged him to become an academic.

“You think experimentally, you’re my best TA. You should go away and tell me what three things you’d like to study,” he recalls her saying. “I came back and I said, ‘The number one thing I’d like to study is psychopaths.’ She laughed. I said, ‘I’ve always been interested in understanding how someone could get that way.’”

Kiehl says that Long connected him to leading psychopathy researchers like Michael Levenson, who developed one of the early scales for measuring psychopathic traits, and whom Kiehl describes as a “surrogate parent.”

(Long did not respond to my email and phone requests for an interview, or to an email in which I requested that she verify Kiehl’s story.)

But in the 1990s, if you wanted to study psychopathy, there was only one place to go, Kiehl says—the laboratory of Robert Hare at the University of British Columbia in Vancouver, Canada. He had pioneered psychopathy research on prison populations. So, Kiehl courted him.

Hare tells me by email that he didn’t accept Kiehl into his lab straight away because “his first few years at Davis were not impressive.” (R. Hare, personal communication, May 10, 2024.)

According to Kiehl, his professors flew Hare to UC Davis to give a talk, and then took him out to dinner, where they were introduced. “They just basically put the screws to him and said, ‘You should really take this kid as a student,’” Kiehl says.

It took another year for Hare to accept Kiehl into his lab. To try and win him over, Kiehl says he drove through a snowstorm to Hare's home and brought him bottles of wine. "He thought I was nuts," he says. "I just said, 'I might not be your smartest student, but I will be the hardest working student you've ever had.'"

Kiehl says he'll never forget the day Hare relented. "He just called me and told me that he was going to accept me and that he expected big things out of me."

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Kiehl's search for the "criminal brain" crystallized in the 1990s. At that time, the rise of brain imaging techniques like fMRI collided with a growing interest in understanding how biological drivers of crime, if they exist, could be analyzed to understand, and even predict, criminal behavior.

When Kiehl was conducting his graduate research, electroencephalogram (EEG) tests, which measure the brain's electrical activity, were used to investigate potential biological abnormalities in the brains of people with criminal convictions. These tests helped to build a body of research that suggested that people with criminal histories have brains with lower electrical activity than those who do not have criminal histories. Because criminals are born with sluggish brain activity, so the theory went, they compensate for their constant lack of stimulation through impulsive and risky behavior.

EEG tests emerged in the 1930s as a promising new method for "decoding" the human brain, but researchers have written they yielded insignificant results for psychiatry as a whole, and for the study of criminal delinquency in particular.

By the late 1990s and early 2000s, scientists who researched the brains of criminals, including Kiehl, had turned to new brain scanning techniques, like fMRI and MRI, to conduct their research. Such techniques held the potential for visualizing the human brain in action with more clarity, precision, and persuasiveness than ever before.

Using these techniques, Kiehl has published studies linking the brain volume and brain activity of incarcerated people to criminal behavior. In other words, brain images could stand as evidence that certain people have atrophied areas of their brains that predispose them to criminality.

He explains his approach in *The Psychopath Whisperer*—an autobiographical account of his research in which he evangelizes about the promise of scanning the brains of the incarcerated. That promise has given him a huge public platform.

For more than 15 years, Kiehl has been a ready source for journalists on the “criminal brain.” His resume and website record a wide range of national and international media appearances and he stresses that this list is not exhaustive. The expansive coverage of Kiehl’s work has even attracted celebrity.

In 2013, he appeared in a PBS documentary called “Brains on Trial,” hosted by the actor Alan Alda, which explores the role of neuroscience in the courtroom. In 2015, he filmed a National Geographic documentary with Morgan Freeman on the nature of evil, where Kiehl and the “Shawshank Redemption” star interview Dugan side by side in a maximum-security prison.

Not everyone is so captivated by his research.

Michael Rocque, a sociologist who has studied the history of criminal brain research in America, says that 50 years ago, research like Kiehl’s was unusual. According to Roque, theories of criminal behavior, tied to innate human biology through brain studies, would have been dismissed as the junk science of criminal anthropology—a line of research, now debunked, which presumed that certain people were “born criminal,” and that they possessed physical characteristics that could be scrutinized through scientific study.

Roque says that Kiehl’s work carries hallmarks of pseudoscientific brain studies from the 19<sup>th</sup> century, like phrenology, which sought to link criminal behavior to specific brain regions.

Satrajit Ghosh, a neuroscientist at the Massachusetts Institute of Technology, says that the brain is still such a mystery, and imaging tools remain so limited, that imaging studies carry the risk of simply confirming what the researchers were looking for. Using a measurement device such as an MRI, a researcher could rationalize any observation they want to see.

“That’s what phrenology is, right? They were measuring bumps and saying, ‘We think this person has this behavior because of these bumps,’” he says. Today, neuroscientists risk doing the same thing with MRI studies. They can design a brain imaging experiment, see brain images materialize on a screen, and then “try to come up with an explanation for it.” That harkens back to phrenology, he says.

Austrian anatomist Franz Josef Gall, one of the founders of phrenology, developed theories of criminal behavior by examining the heads of people convicted of crimes. He ascribed arbitrary terms like “combativeness” and “destructiveness” to bumps and hollows in their skulls. By the mid-1900s, this methodology had been exposed as fraudulent.

Cesare Lombroso, a doctor who worked at an Italian asylum through the late 19<sup>th</sup> century, opened peoples’ skulls and claimed to find abnormal brain features in those who had been convicted of crimes. This helped spur the biological criminology movement, which sought to identify the biological markers of criminality. Lombroso’s ideas sparked a craze for brain dissection, which ultimately failed to identify any differences between the brains of people with and without criminal histories.

By the early 20<sup>th</sup> century, Rocque says, biological theories of criminal behavior had fallen out of favor, overtaken by the shadow of World War II. Such theories carried the memory of Nazi Germany, where ideas of innate criminality, justified through research then depicted as scientifically sound, were used as a tool of social control and as justification for the murder of millions. After the 1960s, sociological theories of crime—theories that proposed, for example, that lack of income or education spurred people to commit crimes—were dominant. Any biological explanations that arose at that time sought to shake the stigma of World War II-era eugenics.

Brain imaging techniques evolved in the 1990s and early 2000s to give neuroscientists new windows into the human brain. They became the basis of studies that claimed to show differences between the brains of people with and without criminal histories.

Roque says that, throughout history, scientists “keep coming back to these ideas.”

“Phrenology is based on the idea that different areas of the brain are responsible for different types of personalities and behaviors. There’s still traces of that here,” Roque says, speaking of Kiehl’s research. “And there’s the risk that we’re going to get it wrong, and that we’re going to end up treating people differently based on flawed science.”

Roque says that scientists’ preoccupation with the brains of criminals throughout history comes from “the seduction of mindless neuroscience.” “It’s a really attractive idea to think that some people’s brains are just different, or bigger, or smaller,” he says. “But it’s always more complex than that.”

Stephen J. Morse, a legal scholar at the University of Pennsylvania, has written about the limited relevance of neuroscience for criminal law, given the inability of neuroscientific research to decipher human behavior from brain scans. He describes Kiehl as a “vast brain over-claimer.”

“I mean, Kent thinks we’re ready to use his tests today to make predictions for recidivism,” he says.

Throughout our conversations, Kiehl insists that brain scans are a promising method for predicting who is prone to criminality in society.

In defense of this idea, Kiehl tells me about an intrusive method of assessing recidivism in sex offenders: “I mean, they do penile plethysmography. They do it to try and assess treatment efficacy. And we’re like, ‘How do you know if that works?’”

When I ask him what he is referring to, he laughs. He explains the procedure in detail.

“You put a string gauge around a penis, and then they put them in a room,” he says, referring to the offender. “And then somebody has to come check and make sure it’s not on their finger. And then

they show them pictures and other things, or they listen to things. And their goal is to try to prevent them from being aroused. We're talking about small changes in tumescence, not a full erection. And then that information is used to measure treatment change."

His point, he says, is that "ancient methods" are still used in the criminal justice system. His brain scanning techniques, he believes, are a more sophisticated and scientific method for predicting criminal behavior.

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Scholars have raised ethical questions about using the brain to predict future criminality in incarcerated people. Incarceration is not merely a symptom of criminal behavior, they say, but a reflection of who is policed and incarcerated in society.

Kiehl says that he believes the criminal justice system is biased toward people of low socio-economic status, not race. Yet data shows that, for almost a century, people of color have been disproportionately incarcerated in the US when compared to whites, and that racial disparities have amplified since incarceration rates began rising in the 1970s.

"It's really socio-economically biased. Because if you go to rural Ohio, it's all Caucasians who are from low [socio-economic status] that are there, but if you go to a city where there's low [socio-economic status] dominated by other minorities, then you're going to get that in the system, and it will be biased in that way," he says. (Data shows that Black people are over five times more likely to be incarcerated in Ohio than white people.)

"But you just have to be able to deal with those types of issues."

Kiehl uses a similar phrase to refer to advice he gave to a prosecutor who had asked him if there was any value to scanning the brains of everyone incarcerated in Chicago's Cook County Jail—America's largest jail system. The idea was to use the brain scans to inform "who should get out and who should stay."

He says he told the prosecutor that there could be “a lot of benefit” to scanning the brains of everyone incarcerated there, but that local officials would face opposition from people who had become “high risk” for committing new crimes.

“You also have to face the issue of Cook County being 70 percent African American,” Kiehl says. “People are going to be unhappy that you’re scanning African Americans and saying that there’s something wrong with their brains. And so you have to be able to deal with that.”

Kiehl told me that the prosecutor was Francis Shen, a legal scholar at Harvard University who once worked with him. When I ask Shen about the exchange, he laughs uncomfortably. He says, “I’ve never been a prosecutor. I think he must be misconnecting something.” He advises me to read Rollins’ work and declines to answer further questions.

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Kiehl uses a controversial screening system created by Robert Hare, his graduate school mentor, to assess incarcerated people for psychopathy. Hare’s checklist is based on one theory of psychopathy proposed in 1941, by American psychiatrist Hervey Cleckley. Cleckley defined psychopathy through a list of 16 personality traits, including unreliability, insincerity, egocentricity, and lack of shame.

Hare expanded and refined these concepts into his own screening system, which consists of 20 traits and behaviors, like “grandiose sense of self-worth” and “pathological lying.” Hare’s checklist is now widely used in the criminal legal system as a method for identifying psychopathy in incarcerated people. It has been criticized for conflating personality traits with criminality.

Despite the lack of agreement about the checklist’s validity, Kiehl believes it reveals whether or not his interviewees display “essential traits of psychopathy” across the majority of their lives. It is foundational to his work.

Each psychopathy trait that arises during the interview is scored on a three-point scale and then assessed on a range from 0 to 40. The “clinical diagnosis” of a psychopath, according to this checklist, is

30 or above. Throughout his career, Kiehl has subjected incarcerated people who score above 30 on the checklist to various brain-scanning techniques to search for any brain abnormality that could explain their behavior.

The latest edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM), which is used to diagnose psychiatric disorders, does not recognize psychopathy as an independent diagnosis. Instead, it is recognized as a personality disorder that exists under the broader diagnosis of antisocial personality disorder.

Scholars have criticized both antisocial personality disorder and psychopathy as false constructs due to their ambiguity and subjectivity. They have also been criticized for their unreliable use in the criminal legal system, and for their ability to further dehumanize people of color in the eyes of juries.

Kiehl has criticized the DSM's criteria for diagnosing antisocial personality disorder because it allows for a vast range of people to be diagnosed with it. "And it doesn't predict anything," he has written. "It's essentially a hodgepodge of symptoms with very little utility," that will only "get you about halfway to the diagnosis of psychopathy."

He believes that Hare's checklist helps to predict future criminality in the incarcerated. For example, in a 2024 study published in the journal *Research on Child and Adolescent Psychopathy*, Kiehl and co-authors wrote that a "youth version" of the checklist was a "reliable predictor" of criminality in a group of Latino boys incarcerated in New Mexico.

Several studies have cast doubt on the checklist's reliability as a predictor of future criminal behavior.

Andra Smith, a neuroscientist at the University of Ottawa, studied alongside Kiehl as a graduate student. Inspired by Hare's research, she has also searched for biological markers of psychopathy in brain scans. (She no longer researches psychopathy but teaches an undergraduate psychology course on



the subject.) She describes Kiehl as “highly motivated” and a “hard worker” who spent long hours in the prisons, conducting EEG studies on incarcerated people.

Like Kiehl, Smith conducted psychopathy assessments of the incarcerated using Hare’s screening tool. She conducted many of these screenings as one-on-one interviews. She says it was intimidating to be a young woman in the confines of a prison, speaking to people alone in an interview room. She felt an acute sense of vulnerability. Yet very few of the interviewees made her feel unsafe. Mostly, they told her sad stories.

“A lot of them were there because they had horrific upbringings themselves. It was like they didn’t even stand a chance,” she says. “I found myself feeling badly for a lot of them—not all of them. But I did find that I had some empathy for a lot of them because they had these really crappy upbringings.” She remembers that many interviewees described growing up in the foster care system, or with parents addicted to drugs, or with parents who couldn’t take care of them.

When screening for psychopathy according to Hare’s methodology, Smith says, “you’re looking at characteristics that are present throughout the lifespan. Early childhood problems, or early run-ins with the law.” Reflecting on this research and on the interviews she conducted with incarcerated people, Smith says, “I am not entirely sure that we really took their trauma into account. We were just establishing whether or not they were a psychopath. We were not establishing why they were psychopaths.”

She does vividly remember one interviewee whom she believes demonstrated traits of psychopathy. He looked at her with “the eyes of a psychopath,” she recalls. They were “empty” and “lacking in empathy.” He shook her belief that she could find the good in everyone.

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“If you plug *The Psychopath Whisperer*, then I’ll be indebted to you,” Kiehl tells me by phone one late fall afternoon.

Kiehl speaks in a high nasal pitch and delivers his thoughts in a rapid-fire narrative style. With minimal prompting, he can speak for more than 15 minutes without interruption, weaving true crime lore into reflections on the promise he believes science holds for predicting who is prone to criminality.

Adrianna Mendrek, a behavioral neurobiologist at Bishop's University in Quebec, Canada, who studied alongside Kiehl as a doctoral student, remembers Kiehl as being "very hyper, high-energy, fast-talking." These words often spring to mind when I speak with him.

When I ask other peers and former students about what it was like to work with Kiehl, or about his personality, they laugh uncomfortably, or speak indirectly.

Peter Liddle, a psychiatric researcher at the University of Nottingham who supervised Kiehl's doctoral research, remembers him as a very "bright and energetic student" who "got stuff done." "There's no doubt it was a very fruitful time," Liddle says. "And a lot of the fruitfulness of that time was attributed to his energy in getting the ambitious stuff done. This notion of recruiting [patients] from the secure hospital and all the rigamarole that went with that, was the sort of stuff that somebody without his day-to-day energy wouldn't have got done."

When I ask Liddle how he would describe Kiehl's personality, he responds, "Well, now we're getting into tricky questions. I want to stick with 'energetic, determined, and getting stuff done.' Those are the adjectival phrases I would use."

Kiehl wrote *The Psychopath Whisperer* after beginning a neuropsychology research position at the University of New Mexico in 2007, where he made his career studying the brains of incarcerated populations in that state. (His university webpage proclaims that his laboratory has created "the world's largest database of brain data" from incarcerated people.)

The New Mexico prisons solved the "logistical nightmare" of gaining access to psychopaths, Kiehl says, because his study subjects remain under the watchful eye of prison guards. He had previously

tried to research psychopaths in the community but found they didn't show up to appointments because they were "pathologically unreliable."

He claims that the New Mexico prisons make for a safer environment for his research team. Though this hasn't stopped his graduate students from feeling frightened.

Kiehl tells me a story about one particular student, a "tall, skinny kid," whom he once took with him on a prison research trip. "We're walking through maximum security, it's his first day, and one of the giants yells out, 'Hey, Dr. Kiehl, who's the new lollipop?' Of course, my first response is to turn and laugh and go, 'What flavor do you think he is?' Like, that was my natural first response, right? No fear, like, whatsoever." Kiehl says the student quit a week later.

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Kiehl's studies on the New Mexico prison population have tended to link the brain volume of those classified as psychopathic, according to Hare's checklist, to criminal or violent behavior.

In an article published July 2022 in the journal *Brain Imaging and Behavior*, for example, Kiehl and co-authors recorded an association between psychopathic traits from the Hare checklist and reduced brain volume and activity in a sample of 241 women incarcerated in New Mexico. They identified, via fMRI scans, reduced volume of the orbitofrontal cortex—a subarea of the prefrontal cortex, at the front of the brain that, while poorly understood, is thought to play some role in decision-making. They also recorded reduced activity in the amygdala—a part of the brain that is believed to play a role in emotional regulation.

Others in the scientific community are skeptical about the reliability of this research.

Ghosh, at MIT, says that human behavior cannot be reduced to any single part of the brain. He also said that it is difficult to localize human behaviors to specific brain regions given the widely disparate functions that discrete brain regions can perform. "I think they could show activity that relates with whatever they're measuring and studying. That is possible. Is it precise? I doubt it," he says.

For instance, ascribing behavior to areas of the prefrontal cortex, according to Ghosh, gets into “murky territory” because the prefrontal cortex appears to do so many things. It is implicated in information processing, language, and working memory, to name just a few broad cognitive functions. One must be careful about ascribing behavior to the amygdala as well, Ghosh says, because it, too, appears to be involved in an array of brain functions. Though there is evidence to suggest that the prefrontal cortex and amygdala are involved in emotional processing.

Ghosh says that neuroimaging techniques, like fMRIs, are only a representation of the brain’s processes, not a real-time snapshot of the brain in its totality. For that reason, they cannot tell us anything directly about human behavior.

“I don’t disagree,” Kiehl wrote in an emailed response. He acknowledged that Ghosh’s view does represent the scientific consensus. (K. Kiehl, personal communication, April 29, 2024.)

While researchers have long relied on different techniques to identify the brain regions that they associate with violent or criminal behavior, Kiehl’s approach is unique in that it is conducted using a mobile MRI machine that he designed and patented, and that processes data through algorithms that he has helped to create.

Kiehl says it’s “the most advanced MRI to be built into a trailer,” and that the algorithms he uses “have a good track record [of] achieving high classification accuracy, which makes us pretty unique in our field.”

Kiehl’s broad claims have been met with disbelief within the neuroscientific community.

Ghosh, at MIT, says that, at the moment, predicting individual human behavior with brain scans is the stuff of “extreme sci-fi.” Having a brain-based view of criminal behavior, he says, is scientifically fraught. “We just don’t have the tools and technologies to measure enough things about the brain to have such strong predictions of any behavior, let alone criminal behavior,” he says.

The problem, he explains, is that we still cannot observe the brain in its totality with the technology that currently exists. Nor would any scientist be able to account for all of the external factors that could influence one's decision to commit a crime. That could be anything from their zip code to the fact that they had once been incarcerated.

"There may be elements of where you live, besides the biological factors, like the stress on your system, where you work, et cetera, that could come into play," he says. "This is why trajectories are really hard to predict. There are so many influences. And if I could predict all the interactions on the planet, that would be fantastic. I could imagine a computational model that could, if it observed every single interaction that took place. But that's a crazy model."

Kiehl says that it would be possible to develop a recidivism prediction model using data from brain scans. He says it would "probably" be better than the prediction data that is used now. But he understands that the idea would be met with reservations. People would ask whether the results could be replicated or generalized.

"But it's still the question, if it's really good, if it really helps us make better decisions, then should we use it? Now, it just comes down to which side of the fence you fall on," he says. "If the algorithm with whatever data in it says you should be let loose, you like the outcome. If the algorithm says, 'I'm sorry, you're gonna have to wear an ankle bracelet for the rest of your life,' or 'You're so high risk we are never gonna let you out,'" people will push back against the outcome, Kiehl says.

Despite his faith in his technology, it hasn't always been foolproof.

In an October 2018 paper published in the Cambridge University journal *Psychological Medicine*, Kiehl and colleagues said that their MRI scans, conducted on 495 incarcerated people in the Wisconsin and New Mexico prison systems, revealed an association between people with psychopathic traits and reduced volume in the corpus callosum—a nerve tract that connects the left and right sides of the brain. In February 2019, the paper was retracted with minimal explanation.

“[U]pon re-examination of the correct volume measures, the reported effects do not hold, negating the interpretations and conclusions presented in the article,” Kiehl and his co-authors wrote.

Kiehl says that the errors were “an honest mistake.” He puts it down to a student not using the data properly. He says that the student “learned a valuable lesson.” (K. Kiehl, personal correspondence, April 29, 2024.)

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When I first spoke to Kiehl in November 2023, he offered to find ways to embed me in his research. He even offered to scan my brain at his lab in New Mexico. I made arrangements to travel there in January 2024. The week before my trip, Kiehl said he was no longer available. When we spoke again in February 2024, he rescinded the invitation.

Since he had invited me to experience his methodology for myself, I asked him if he had ever taken Hare’s psychopathy test or scanned his own brain. Referring to the psychopathy test, he says, “My own score is likely below the community mean. Quite boring, really.” He says he has scanned his brain hundreds of times. “I have an unremarkable brain according to my radiologist, but it does feel like it’s getting old quickly.” (K. Kiehl, personal correspondence, April 22, 2024.)

During our interviews, it’s hard to pin Kiehl down on details.

He told me that one day in 2007 or 2008 (he doesn’t remember which), someone from a government agency (he doesn’t know who, or from which agency) asked him if he could take his mobile MRI to Guantanamo. He says he was asked to identify whether people imprisoned there had knowledge of certain locations or places, according to their brain scans.

He declined for ethical reasons. “I don’t think it would have been done on a voluntary basis,” he says. “But it’s not like that’s unreasonable.”

When I ask about the future of his research, he tells me that he is looking to expand his work to a psychiatric facility in Washington State, and that he’s applying for grants. “We have collaborators at

Western State Hospital in Washington State, their state forensic facility,” he tells me. “I talked to the director, and I said, ‘If I brought a [MRI] machine there, would you let me scan every single patient?’ ‘Yep,’ they’re like, ‘sure.’”

A spokesperson for the Washington State Department of Social and Health Services told me that the chief medical officer of Western State Hospital had never heard of Kiehl or spoken with him. Nor had other doctors at that facility heard of Kiehl or spoken with him.

When I present this to Kiehl, he insists two of his students worked as interns at Western State Hospital “a while back,” and that their supervisor was “very interested” in having him conduct research at the facility. Kiehl did not respond to an emailed request for the names of people he claims to have spoken with.

Kiehl also tells me that he’s “lectured to probably every federal judge in America” about how to tell good neuroscience from bad.

When he tells me this, he is referring to his tenure with the Research Network on Law and Neuroscience, a think tank of legal scholars and neuroscientists funded by the John D. and Catherine T. MacArthur Foundation from 2007 to 2021. Its stated goal was to “make neuroscience accessible and beneficial to America’s courtrooms.” As part of this effort, lawyers and neuroscientists, including Kiehl, met with federal judges across the country.

Morse, of the University of Pennsylvania, was part of this cohort. He said that he witnessed many of Kiehl’s lectures to federal judges. He found it “frustrating,” because Kiehl was constantly overstating the relevance of neuroscience for the law. Kiehl did not take in any feedback from Morse or his colleagues, he says. Kiehl just “brushed it off.”

Kiehl later admits that his claim of lecturing to “just about every federal judge in America” was an overstatement. “I don’t know how many federal judges there are but I did lecture to 1000s of them

and I certainly traveled enough over those years to feel like I had lectured to all of the federal judges in the US!” he writes in an email. (K. Kiehl, personal communication, April 29, 2024.)

There are 890 federal judgeships. Over 70 of those seats are currently unfilled.

He notes that he still lectures to judges. “I talk with many of them routinely and actively consult if they request it,” he writes in an email. (K. Kiehl, personal communication, April 29, 2024.)

Over the course of our interviews, I hear Kiehl trying to embody the persona of a scientific maverick. It’s the same persona he’s portrayed to the media for so many years. Yet, the more questions I ask of him, the more I try to tune into his point of view, the more his stories seem to unravel, and the flimsier his pursuit of scientific advancement appears. By the end of our conversations, I don’t know whether to trust him.

We are told that science moves inevitably towards progress. Yet Kiehl’s science seems inextricably linked to concepts of the past. It seems unlikely that he will ever unlock the biological roots of criminality that eluded his predecessors.

I ask Rollins whether we should be concerned that neuroprediction is a pseudoscience.

He makes the point that it risks reinforcing racial inequalities in society today, just as eugenics did. But he is careful not to label it a pseudoscience. To do so would be to deny how ideas from the past are still carried forward in scientific research of today. After all, he says, “We call eugenics a pseudoscience. But it was the science of its day.”



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