

## #78 (ADRIAN RAINE)

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### Jerry Ratcliffe:

Reducing Crime features conversations with influential thinkers in the police service, and leading crime and policing researchers.

Adrian Raine is the professor of criminology, psychiatry, and psychology at the University of Pennsylvania. His area of expertise is neurobiology of antisocial behavior in children and adults. We have a fun and accessible chat about everything from psychopaths to the nature or nurture debate.

### Jerry Ratcliffe:

This is Reducing Crime, and I'm Jerry Ratcliffe. Adrian Raine is the Richard Perry University professor of Criminology, Psychiatry and Psychology at the University of Pennsylvania. Yes, I know that can already sound a bit intimidating, but trust me, you're going to enjoy this episode. Initially, unable to get an academic gig, Adrian spent several years working in British maximum-security prisons. This gave him considerable insight into antisocial behavior and a close shave you'll hear about.

It's a topic he now studies from a neuroscience, developmental and social perspective. A pioneer in the area, Adrian was the first scientist to use neuroimaging to study the brains of murderers. His 2013 book, *The Anatomy of Violence*, won that year's prestigious Athenaeum Literary Award. He has a bachelor's in experimental psychology from Oxford University and a PhD from York University. He is an incredibly prolific scholar.

Amassing over 60,000 citations for his work and for us nerds out there, an H index of 127. Which if you don't know what an H index is, just trust me, that's a hell of a lot. But it probably already went up again just while I was saying that. He really is the father, the godfather, hell, he's the holy trinity of research on the neurobiological and biosocial causes of antisocial and violent behavior. I dropped by his office on the beautiful campus of the University of Pennsylvania in West Philadelphia to have a cheery chat about psychopaths, mass murderers, and to learn that I pretty much have every biosocial trait necessary to be a serial killer. Not that anyone who's ever known me would be in the slightest bit surprised to hear that.

### Jerry Ratcliffe:

It's the guests, come on.

**Adrian Raine:**

You'll pick the guests though.

**Jerry Ratcliffe:**

Yeah, well, I'm like the criminology version of Tyrion Lannister. I know people and I drink!

Obviously, I had to come and chat to you because even though your work is obviously really, really academic and very, very scientific-

**Adrian Raine:**

Very boring.

**Jerry Ratcliffe:**

No, well-

**Adrian Raine:**

Yes it is.

**Jerry Ratcliffe:**

It won't be as a result of this podcast, trust me. But it has relevance for criminologists and people who are researchers just thinking about the importance of scientific rigor. But also for people who I think are in policing. We're talking about violence and just understanding violence and in the end there's a part of it that's core knowledge stuff almost, isn't it?

**Adrian Raine:**

Yeah, basic knowledge, basic science. Hopefully it's a level that we can communicate on as well because I think that's always the channel, especially with biological research in neuroscience. There's a lot of jargon in it. It can be difficult to distill that down and get the message out. It really can be deadly boring, even to me. I look back at some of the things I've written and think, oh my god, where was I?

**Jerry Ratcliffe:**

Every now and again when somebody comes to me in a conference says, "I was reading your work." My tendency is just, oh, I'm so sorry.

**Adrian Raine:**

Just shrink away.

**Jerry Ratcliffe:**

Why would you do that to yourself?

**Adrian Raine:**

Oh my god, yes.

**Jerry Ratcliffe:**

How did you end up in this? You're not from Philly born and raised, right?

**Adrian Raine:**

No, that's true. People do ask me that. Going back in time, I didn't even want to go to university when I was 18. I left school to become an accountant with British Airways.

**Jerry Ratcliffe:**

Now you know how to live an exciting life.

**Adrian Raine:**

I know. Because I knew two things about myself. I knew I was good at adding up numbers, and I knew I was a very boring person. I thought numbers.

**Jerry Ratcliffe:**

Who 18 thinks they're a boring person?

**Adrian Raine:**

I did. I knew I was boring. I was very boring. I had very few friends. I've changed over time.

**Jerry Ratcliffe:**

You've solved that by writing papers about Omega-3 and all that.

**Adrian Raine:**

But I think at that time I didn't care too much for school and I just wanted to get out into the real world, a real job. But you know what? Accountancy is really boring. I lasted two years at British Airways and I just had to get the hell out of there. Then I went to university. Some people, it's a straight line. For me, I was all over the place.

**Jerry Ratcliffe:**

You came to university and did?

**Adrian Raine:**

Psychology.

**Jerry Ratcliffe:**

Where did you go?

**Adrian Raine:**

I went to Oxford University. I went to Jesus College. I was brought up as a Catholic, and when I was picking the college, I thought, oh, Jesus sounds cool.

**Jerry Ratcliffe:**

That was the sole criteria?

**Adrian Raine:**

Isn't it terrible? We're idiots when we're 18 or 20.

**Jerry Ratcliffe:**

Well, I'm continuing that right the way through in life. But yeah.

**Adrian Raine:**

I did psychology and then during my holidays I worked for a charitable trust taking kids on holiday camps and I really got to love it. I began to think to myself, working with kids, that's it. I decided I'm going to be a primary school teacher. I got my teacher training place all worked out. A graduate student sat next to me, and she said, "Oh, what you going to do?" I said, "I'm going to be a primary school teacher." She said, "No, you should be a professor." I said, "No way. I can't do that." She said, "Why not?" I said, "Well, I'm not one of those really bright students." Because you know in your cohort who the really smart creative people are.

**Jerry Ratcliffe:**

Oh yeah, they're really irritating, aren't they?

**Adrian Raine:**

Oh, very. Very annoying. I knew I wasn't one of them. But she said, "Yeah, you could do it." You know what? I went back to my flat that night and I made late applications to do a PhD and I got accepted in two places. At that time, when you go to interview for a PhD, you've got to know what you're going to do.

**Jerry Ratcliffe:**

Yeah, that's the British system.

**Adrian Raine:**

Yeah, it's the British system.

**Jerry Ratcliffe:**

You actually apply to do that specific role.

**Adrian Raine:**

I look back at all the essays I'd written for tutorials, and one of the better essays I'd written was on biological basis of psychopathy. I've been on that one track now really ever since. A bit of serendipity.

**Jerry Ratcliffe:**

Some of the best careers seem to be accidental.

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**Adrian Raine:**

Yeah. If that student hadn't sat down, she wasn't a professor saying, oh, Adrian, you are really bright and smart. No, I wasn't. I was a second-class honors degree.

**Jerry Ratcliffe:**

But I sometimes think that the skills that you need to be good at undergraduate aren't necessarily the skills you need for a PhD.

**Adrian Raine:**

It's true, isn't it?

**Jerry Ratcliffe:**

Because I think a lot of undergraduate training isn't about fostering creativity however much we may use that kind of language. But a good PhD is about creativity.

**Adrian Raine:**

Jerry, I'd like to think you're right. Because I think what I did at that time is I took the existing research, which was really minimal, a biological basis to psychopaths. Now, psychopaths are a rare breed as we know.

**Jerry Ratcliffe:**

I don't know, I've worked with a few.

**Adrian Raine:**

Well, there are few kicking around, even in academia I might say. What I thought to myself is, well, if there's a biological basis to this extreme form of antisocial behavior, what about kids at school? Kids who are antisocial? That's what I did my PhD on. You get them from school, I bring them into the lab and I'd measure their EEG, their brain waves, their sweat rates, their heart rates, and I get the teachers to rate how antisocial they were.

**Jerry Ratcliffe:**

That even get past the IRB nowadays?

**Adrian Raine:**

I'm not sure. There wasn't an IRB at the time I was doing, this is back in 1977. This is really going back. I had data there, so I was able to pass my PhD.

**Jerry Ratcliffe:**

Where was your PhD from?

**Adrian Raine:**

York University in the north of England.

**Jerry Ratcliffe:**

The high proportion of psychopaths in York?

**Adrian Raine:**

Not exactly. Really at that time Jerry, in psychology, pretty well nobody was studying antisocial behavior.

**Jerry Ratcliffe:**

Really?

**Adrian Raine:**

No. What I had to do is I had to find a professor who had a laboratory where I could learn, it's called psychophysiology. That's the brain waves, sweat rate, heart rate. That I could be taught how to do that. I took to the laboratory my interest in antisocial behavior.

**Jerry Ratcliffe:**

A lot of your work has looked at psychopaths. You did the first neuroimaging of murderers, didn't you?

**Adrian Raine:**

Yes, I did.

**Jerry Ratcliffe:**

How well does this go down at parties when you would tell people what you do?

**Adrian Raine:**

They're always interested. I think that's what I've enjoyed, Jerry, is that by and large, especially in the public, students, they have a general interest in, oh, brains of psychopaths, brains of murderers. Do they differ to us? Do they differ physically to us? I think that's generally interesting to people at all levels.

**Jerry Ratcliffe:**

See, the last thing I ever tell people at parties is I was a poli officer. Because that goes down a whole different route.

**Adrian Raine:**

Yeah, I could just imagine that.

**Jerry Ratcliffe:**

The very first thing you said to me when we met a while back at a dinner party, just off the campus here, organized by John MacDonald. We sat down and you said, "So Jerry, do you have a low resting heart rate?" That was the first thing you said to me.

**Adrian Raine:**

I've forgotten that. I'd like to know who I'm sitting with basically.

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**Jerry Ratcliffe:**

Is this your opening gambit for anybody you meet at dinner?

**Adrian Raine:**

Well, I'd like to cast them as either antisocial-prone or socialized.

**Jerry Ratcliffe:**

Oh, I could have told you the answer long before you did that.

**Adrian Raine:**

But low resting heart rate, that came out of my PhD. Of the things I found is that school kids who are antisocial, they had low resting heart rates compared to kids who were well-behaved.

**Jerry Ratcliffe:**

I was very poorly behaved in school, so much so that I couldn't go to university. I had to go and join the police, which seems oxymoronic.

**Adrian Raine:**

I'll come back to that. Why you joined the police and your heart rate. It sounds a bit of a weird, thick, low resting heart rate, pre-disposing. Now we've found from hundreds of studies that it generalizes to predicting crime, violence, a whole broad spectrum of antisocial behavior.

**Jerry Ratcliffe:**

Do we know the mechanism?

**Adrian Raine:**

Yeah, one reason might be that kids get fit running away from the police. Or getting involved in a fight is a good cardiovascular workout. The delinquency causes the low heart rate. But we think it's the other way around. One of the theories is called stimulation-seeking theory. It's the idea that there's an optimum level of arousal. If you're below that, it's uncomfortable. What you do, you seek out stimulation to get your heart rate back to normal. For some kids, one way of getting stimulation in life is joining a gang, beating someone up, robbing a store. It's their way of getting that buzz in life. Maybe that's why I was asking you about your heart rate because viewing you as a stimulation seeker.

**Jerry Ratcliffe:**

Well, I think you did look at my resume and I've had a background doing adventure training in the outdoors and as a pilot and scuba diver and stuff like that. This constant speaking of stimulation. It can have positive benefits if it's channeled in the right direction?

**Adrian Raine:**

Yes, absolutely. There's studies from England that have shown that bone disposal experts have low resting heart rate. These are people who save lives, they don't take lives, they save lives. That's one example of an adaptive aspect of this

low resting heart rate. Maybe in the right environment, if you're brought up in a certain social environment, you can channel your stimulation seeking temperament to doing good things.

**Jerry Ratcliffe:**

Joining the police.

**Adrian Raine:**

Joining the police. The army.

**Jerry Ratcliffe:**

You were one of the first people to discover this in your PhD.

**Adrian Raine:**

Yes.

**Jerry Ratcliffe:**

This was back in the '70s, early '80s?

**Adrian Raine:**

It was 1977 to 1980s when I did my PhD. That may be the only thing I've done that really replicates and everything else fails to replicate. But that's the one thing I can point to say, yeah, I was there in the early days and it's born fruit.

**Jerry Ratcliffe:**

How did that translate to then moving through your career to really looking at other aspects of antisocial behavior then?

**Adrian Raine:**

Well, I think it was a beginning looking at heart rate. In the days that I was studying my PhD, there was no brain imaging.

**Jerry Ratcliffe:**

That was just an emerging science at that time.

**Adrian Raine:**

It really was, Jerry. Yes. That was really exciting to me because you can literally go inside the mind of a murderer, look at their brain and see what part of that brain, if any, maybe not functioning well.

**Jerry Ratcliffe:**

If you carry on like this, it'll become one of those true-crime podcasts.

**Adrian Raine:**

Yes.



**Jerry Ratcliffe:**

Because there is an absolute fascination. We have a fascination with this.

**Adrian Raine:**

We do. We do. I'm intrigued about why we have a fascination.

**Jerry Ratcliffe:**

Yeah, I don't get it.

**Adrian Raine:**

Crime and violence. I feel that there's an evolutionary basis to this. That going back to early hominids, I think it paid them to pay a lot of careful attention to who amongst them was the danger man. Who they had to be really careful with. Because it's life and death. If you die, you don't reproduce, your genes don't reproduce in the next gene pool.

**Jerry Ratcliffe:**

There's an easier way to figure that out. Nowadays, we just ask are they on the faculty?

**Adrian Raine:**

Well, as I've mentioned before, yeah, there are psychopaths in academia and there are psychopaths in all areas of life.

**Jerry Ratcliffe:**

Is there like a baseline level? Is that one in a hundred? One in a thousand? Do we have a sense of this?

**Adrian Raine:**

Yeah. Now it has to be estimated. But in terms of estimates, it's estimated at around two or 3%. More common in males than females, just as crime is more common.

**Jerry Ratcliffe:**

When we talk about the label of a psychopath, what exactly are we talking about?

**Adrian Raine:**

We're talking about people who lack remorse. They lack guilt. They are also stimulation seekers. They are glib, they're charming, they're grandiose, they're selfish, they're egocentric.

**Jerry Ratcliffe:**

I feel so seen.

**Adrian Raine:**

They have unstable lifestyles and they commit crime. They have an early history of antisocial behavior. It's a whole mélange of about 20 different characteristics.

**Jerry Ratcliffe:**

You need to hit a certain number of those to get that label, that trigger?

**Adrian Raine:**

Yes. On the psychopathy checklist developed by Robert Hare, you need to score 30 points out of 40. Out of 20 traits, having about 15 of those traits really check the box on about 15 out of the 20 traits.

**Jerry Ratcliffe:**

Are these things that are static, we're just stuck with them, or are some of them dynamic? Can we unlearn them? Once a psychopath always a psychopath. I never thought I'd say that. Or is it something that you can drift in and out of in different life stages?

**Adrian Raine:**

I think the feel feels no, there's no drifting in and out, unfortunately. It's a big challenge because we want to change psychopathy.

**Jerry Ratcliffe:**

Right. But that feels like then it's untreatable.

**Adrian Raine:**

That's been the law. I must say that the researchers in this field are really trying hard to develop new innovative interventions that can maybe tackle some of the features at least of psychopathy. Maybe not changing all of it, but tackling impulsivity. But it's difficult Jerry. After getting my PhD, my work wasn't popular at all, the biological basis of antisocial behavior so I couldn't get an academic job.

**Jerry Ratcliffe:**

Really?

**Adrian Raine:**

But I could get a job working in prison. I worked for four years in top security prisons in England as a prison psychologist. As you know, there's plenty of psychopaths in prison.

**Jerry Ratcliffe:**

That's just on the correctional side. Yes.

**Adrian Raine:**

Oh yeah, on the other side. Well, we better not talk too much about prison officers. Let's not go down that rabbit hole. But your intuition is right.

**Jerry Ratcliffe:**

It's all right, it's all right, they don't listen to this podcast.

**Adrian Raine:**

That's good. Really what I found is that with the best will in the world, I couldn't really make much of a difference. I could do relaxation training. I could do some cognitive therapy with them., But I felt I was banging my head against the wall, honestly, working with 35-year-olds. That got me back to trying to go back in time to study kids and look at what are the factors that can push a kid into a life of psychopathy. Because as we could all imagine, kids are going to be easier to change than 35-year-old psychopaths.

**Jerry Ratcliffe:**

Of course, what you're really looking for to some degree is can they be steered in a different direction?

**Adrian Raine:**

Yes, indeed. Yeah, can we get them off that negative impulsive stimulation-seeking path?

**Jerry Ratcliffe:**

Do you think that your work in the prisons, not many academics do this, but that gave you a really practical bent and real experience? Do you think that's helped inform your academic career since then?

**Adrian Raine:**

I think it certainly did. Because it gave me a real insight into psychopathy, I felt. Because I had to assess every new prisoner coming into a prison. I was able to build in the psychopathy checklist, which allowed me to assess who was a psychopath and who was not. Again, I did some physiological research on those psychopaths in prison.

**Jerry Ratcliffe:**

Academia opened up for you?

**Adrian Raine:**

Yeah, academia eventually opened up. I must say that after getting my PhD, I applied for 67 academic jobs over four years and got 67 straight rejections. It was only the 68th job that I got a break and that was at Nottingham University.

**Jerry Ratcliffe:**

My alma mater.

**Adrian Raine:**

Oh, of course.

**Jerry Ratcliffe:**

Geography department.

**Adrian Raine:**

Yeah. I was hired in the medical school. I taught psychology to medical students. That's where I learned brain imaging. I was there for three years before I moved across the pond to the United States.

**Jerry Ratcliffe:**

To here?

**Adrian Raine:**

To Los Angeles, in fact. I went to a conference in Italy and the conference organizer came up to me and asked me if I'd like a job in Los Angeles. I said, "No." I'd never wanted to come to America, no interest.

**Jerry Ratcliffe:**

how long have you been here now?

**Adrian Raine:**

Oh my god, I've been here more than 30 years. Yeah. It's incredible.

**Jerry Ratcliffe:**

It sneaks up on you, doesn't it?

**Adrian Raine:**

37 years actually, I've been here. I must say I'm very grateful to the United States.

**Jerry Ratcliffe:**

Me too.

**Adrian Raine:**

Because work in my country, England, there was that lack of creativity I would say. The work I'm doing wasn't on anyone's radar screen. But people in the United States, even way back in 1987 when I was hired, they were interested in it. They had a curiosity. Well, we've heard a lot about these important social factors that give rise to crime, but hey, what about these biological factors? There's the guy here that's looking at that, let's find out a little bit about this from him.

**Jerry Ratcliffe:**

What did your colleagues in the medical school think when you said, well, we've got this fantastic machine. What I really want to bring is these homicidal murderers and shove them in the machine and take a look and see? What did they say in the prison service too when you wanted to do that?

**Adrian Raine:**

Well, in the prison service, when I was working in prison, I had a Ford Transit van that had a psychophysiology laboratory in it.

**Jerry Ratcliffe:**

That's not creepy.

**Adrian Raine:**

I drove it from York to Hull. I parked it in the parking lot at the prison. Every day I'd drive it into the top security person and I'd recruit a prisoner. I'd get him in the van, and I'd measure his brain wave activity, his heart rate, sweat rate. The prison officers were interesting. There was two of them with a dog right outside the van. They would take the keys from me and lock me up in the van. Three of the prisoners that I assessed were hostage takers.

**Jerry Ratcliffe:**

We're not sure about this academic, so you can have him as a freebie.

**Adrian Raine:**

I was able to do that even in a top security prison. It wasn't until the late 1990s that I was able to do some good brain imaging. The work on brain imaging and murderers. I published in 1994.

**Jerry Ratcliffe:**

There is a difference.

**Adrian Raine:**

Yes. We found that as a group, the 41 murderers that I was able to round up and brain scan, they had poor functioning in the very frontal part of the brain. The part of the brain that's involved in emotion regulation. Most of us get angry at times, Jerry, but what stops us lashing out? We have a good prefrontal cortex that says, let's count to 10. Let's step back a little bit. This isn't the time to lash out. It's like the guardian angel on behavior. But if the guardian angel is asleep as it is in some murderers, then the devil can come out, people can get killed.

**Jerry Ratcliffe:**

Is there aspects of this that are valuable to policing, to crime prevention you think?

**Adrian Raine:**

I don't know. Because crime prevention, we're involved in policing, we're involved in catching the people. Are we interested in what's causing these people to commit these crimes and how can we change them? The police can't do everything, and I don't think it's necessarily really in their remit to have to deal with these programs. The police have enough to be able to deal with in the day-to-day running of their jobs. I think it's partly up to academics to try and develop new programs to try and stop the rot. To get the antisocial teenager off the criminal way of life. I can't say that the police have that responsibility necessarily. You may disagree though.

**Jerry Ratcliffe:**

No, it strikes me that, at the moment, we just keep piling more and more on the police. I actually like to hear that crime prevention is somebody else's responsibility as well. It's refreshing.

**Adrian Raine:**

Yeah. I think it has to be. The other aspect of this, which I always find a little bit depressing, is that those academics can do the work and we can even have a breakthrough. Or we can have a new approach to treatment. But will it get taken up in practice how it gets applied in society? That's something I felt I've honestly been remiss on. I just don't think that I've done enough to try and get out the message to the public. I'm pleased to be on your podcast in a tiny way to get a little bit of the message out.

**Jerry Ratcliffe:**

That message would be fundamentally what?

**Adrian Raine:**

Well, one of the new approaches that I've been taking in the past 10 years is looking at intervention and on the biological side of the equation, what are we going to do to change the brain to change behavior? Because in the area that I study, biology, that's how I've got to think. The brain is a hard nut to crack. Changing the brain is not easy.

**Jerry Ratcliffe:**

There's got to be a joke somewhere in there about the brain being a nut to crack. I just can't think of one right now. I was too intrigued just listening you to talk about this because I'm also looking at this poster on the wall, which I have got to post online on [reducingcrime.com/podcast](http://reducingcrime.com/podcast) and your page. You've got brain scans of normal, a murder and a multiple murderer.

**Adrian Raine:**

They're different.

**Jerry Ratcliffe:**

Yeah, they're very different.

**Adrian Raine:**

I think that's the interesting thing, that even anyone in the public can look at that and say, well, they are different, don't they? That multiple murder.

**Jerry Ratcliffe:**

It's mainly differences in activity in the...

**Adrian Raine:**

That prefrontal cortex.

**Jerry Ratcliffe:**

The prefrontal cortex.

**Adrian Raine:**

That's right. Because you look at the one-off murderer, the impulsive murderer. By the way, the prefrontal cortex is at the top there. The colors are cooler, meaning low brain functioning. The normal has pretty good brain functioning at the top of the picture there. Serial killer has that and a lot of other activity lighting up too.

**Jerry Ratcliffe:**

That seems contradictory. You've got less prefrontal cortex stimulation in one-off murderers, but overactive across a whole area.

**Adrian Raine:**

In the multiple murderer.

**Jerry Ratcliffe:**

... for serial killers.

**Adrian Raine:**

Well, it's not explaining why people become a serial killer. But the serial killer has good frontal lobe functioning. They're able to plan, regulate, control. They can check on their impulsive behavior. They're less likely to be able to get caught. One of the reasons for that is that unlike the one-off killer, they've got their brain together.

**Jerry Ratcliffe:**

With one-off killers, it's often an impulsivity.

**Adrian Raine:**

Exactly. A lot of emotion.

**Jerry Ratcliffe:**

But with serial killers, it's the opposite. It's a lack of empathy.

**Adrian Raine:**

Yes.

**Jerry Ratcliffe:**

But all that ability kicks in to be able to plan, to be able to commit multiple offenses without being caught.

**Adrian Raine:**

That's right. One finding we have from our brain imaging research in psychopaths is that they have a part of the brain called the amygdala that's shrunken. That's 17% reduced in volume compared to the normal person.

**Jerry Ratcliffe:**

What does that part of the brain do?

**Adrian Raine:**

The amygdala is the key part of the brain involved in emotion. The core characteristic of the psychopath is that they lack emotion. They lack remorse. They lack guilt. They lack empathy as you say. It's a structural abnormality to the amygdala. That raises an interesting question in my mind. Because do psychopaths ask to have an amygdala that's three sizes too small? No, this is anatomy. You can't really regulate the size of your amygdala.

If they weren't responsible for having that shrunken amygdala, that shrunk their emotions, that shrunk down their empathy and they're caring for other people that nudged them to be nasty and vicious with people and even to kill people, then can we fully blame them? That's a very difficult question I think for society and there's no easy answer to that.

**Jerry Ratcliffe:**

No, and you're absolutely right. Because then we generally say that men's rear, there's a degree of responsibility and culpability. But now we're finding biological reasons why that might be limited or absent.

**Adrian Raine:**

I think we'd all agree, we have to get these people off the street. There's no question about that. No matter what the cause is. I think the question is, how we deal with these people, how we adjudicate them. To what extent do we take a punitive approach? By the way, I think most of us in society are here for punishment. We want an eye for an eye or a tooth or a tooth, a pound of flesh. These people did wrong. They need to pay for it.

We raise kids that way. If they do something wrong, we punish them. It's how we were brought up. The other side of the coin is, if there are a whole load of factors early on in life beyond their control that shaped their criminal behavior, whether it's early deprivation, poverty, discrimination, bad parenting, abuse, all the social factors.

**Jerry Ratcliffe:**

You make that sound like a bad thing, and it just makes me sound like childhood.

**Adrian Raine:**

Well, I think for a lot of us, we've all had a taste of-

**Jerry Ratcliffe:**

It was the '70s.

**Adrian Raine:**

It was a different world, wasn't it?

**Jerry Ratcliffe:**

Yeah.



**Adrian Raine:**

Those were the good old days, Jerry.

**Jerry Ratcliffe:**

But here's the question for you then. Because if all of those things are predictors, what's the false positive rate? Because don't we run the risk of virgin to that kind of minority report getting ahead of things when we can't guarantee that people will end up in criminal lifestyles?

**Adrian Raine:**

I think we never will get perfect prediction. It's certainly imperfect right now. One of the things I've been doing my whole career is trying to argue for putting together biological factors with psychological and social factors to better predict who's likely to become a serious criminal offender. The prediction is not good, but it is getting better. I think there's a question here for the future. Because at some point in time putting together information from lots of disciplines, including medical data, I think a point will come when we'll be able to say there's a reasonable chance that this person will grow up to become a violent criminal offender. Let's think about the future. You are a parent.

**Jerry Ratcliffe:**

Not that I know of. None that I'm paying for.

**Adrian Raine:**

Imagine you're a parent, Jerry,

**Jerry Ratcliffe:**

I do like to practice. Carry on.

**Adrian Raine:**

Say, in the future, I come up to you and I say, "Your little Johnny's rotten. He's a bad egg."

**Jerry Ratcliffe:**

Winning approach to start with. But yeah.

**Adrian Raine:**

We put together the social biological medical data on him. Right now we can say that with no intervention, he's got a 65% chance of growing up to become a violent criminal offender. That's the bad news. The good news is we've developed new interventions and prevention programs that can stop the rot. They've got a 70% chance of working and making sure he'll never become a violent criminal offender. He has to be taken away from you because you're one of the reasons why he is antisocial, you're a bad parent.

**Jerry Ratcliffe:**

Going to guess if the plan is to soften this message at some point, but yeah.

**Adrian Raine:**

Yeah. Well, for two years and then he'll be back in society. The question is what would you do? Would you say, look, it's only 65, 70%? There's a chance that we do nothing and he'll be just fine. Otherwise, I'm telling you, if you don't do anything, it's going to ruin his life, your life and the lives of innocent victims. If you do nothing, you could have blood on your hands.

**Jerry Ratcliffe:**

It's a fascinating ethical dilemma because we can vary those percentages.

**Adrian Raine:**

We can.

**Jerry Ratcliffe:**

The answer's going to end up being different, but it'll be different for everybody.

**Adrian Raine:**

It'll be different for everyone.

**Jerry Ratcliffe:**

There's no easy, simple answer. If it was 99% chance of you becoming a serious violent offender, but the numbers you're coming up with are not as clear.

**Adrian Raine:**

They're not, and they're not even there yet. This is, I'm thinking something in the future. But it's maybe something that will have to begin to think about and talk about now. Because I think with advances in machine learning and statistics, I think we'll do a better job of prediction.

**Jerry Ratcliffe:**

It's not an issue of people are serial killers, nature versus nurture. That's not the argument here. There is a nature component to it, but with the right programs that can be overcome by nurturing within society in a different mechanism.

**Adrian Raine:**

Exactly, Jerry. You put it exactly right. I think what frustrates me a lot, and it frustrates a lot of my colleagues, is that in the National Institute of Health, they're not bothered about crime. They're not bothered about violence. We have a lot of difficulty getting funding from the National Institute of Health to deal with antisocial violent behavior. They won't fund that.

**Jerry Ratcliffe:**

But it's funny because health people so often claim that violence is their lane, but they don't want to fund it. They just want to tell us how to do it.

**Adrian Raine:**

That's right. Also, at another level, there's a discrimination against antisocial behavior in schools. We will screen kids for learning disabilities and we'll put them in programs to help them, but what about screening for antisocial behavior in school? What about giving those kids programs that are going to help them at an earlier age?

**Jerry Ratcliffe:**

Sounds great to me.

**Adrian Raine:**

People will say, "Oh, you are labeling individuals." We don't have to be doing that. We can label them as emotion regulation programs or impulse control programs, which can help all sorts of kids.

**Jerry Ratcliffe:**

Honestly, the school I went to, if you got Labeled and being in the psychopath club, it would be a badge of honor.

**Adrian Raine:**

It would actually, that's true.

**Jerry Ratcliffe:**

You'd do that with some 14-year-olds, they'd think that was cool.

**Adrian Raine:**

Yeah, and it's a bit of a badge of honor in prisons too. Absolutely.

**Jerry Ratcliffe:**

Really?

**Adrian Raine:**

Yep. That is what I found when I was working in prisons. But I think there's so much more that we could do and instead we wait far too late when the die is cast and the kids are going to be much harder to change.

**Jerry Ratcliffe:**

I can see why it's difficult to get funding, because what you're really saying is if we intervene with a 10-year-old, we may stop people getting murdered 20 years later.

**Adrian Raine:**

Exactly.

**Jerry Ratcliffe:**

That's a timeframe that people don't really want to think about. But how do you successfully do that kind of longitudinal research?

**Adrian Raine:**

It is difficult. I've been doing longitudinal research in Mauritius, which is a tropical island in the Indian Ocean, leading the project since 1988.

**Jerry Ratcliffe:**

A couple of years, yeah.

**Adrian Raine:**

36 years, and we've had 33 years of continuous funding.

**Jerry Ratcliffe:**

Well, good for them.

**Adrian Raine:**

We've got some clues from that program that I think may be helpful today.

**Jerry Ratcliffe:**

You've been doing research in something called Omega-3, which sounds like a bad sci-fi movie.

**Adrian Raine:**

They should make a bad sci-fi movie with that name. That would be really interesting. But yes, in this Mauritius project, we had kids who are age three and we had pediatricians assess them, to assess signs of malnutrition. What we find is that the kids with poor nutrition early on in life, they're more antisocial at age eight, age 11, age 17. We controlled for social adversity and low socioeconomic status, low income. That got us on to the idea that there's something about poor nutrition that's predisposing to antisocial behavior.

That basic science knowledge can put us on to a new intervention approach, Omega-3. The other thing we did is, we did an intervention program from age three to five where the kids would get better nutrition, more physical exercise, and a cognitive stimulation. There's quite a lot going into that intervention, not just better nutrition.

**Jerry Ratcliffe:**

What cognitive stimulation do you give a 3-year-old?

**Adrian Raine:**

Preschool.

**Jerry Ratcliffe:**

Okay.

**Adrian Raine:**

Because at that time in Mauritius, there were no preschools at all in Mauritius. The two preschools that were set up in Mauritius became the model for the whole preschool program that Mauritius has today.

**Jerry Ratcliffe:**

You said you had no impact. Good for you. It's fantastic.

**Adrian Raine:**

I must admit it was my PhD supervisor who did that, not me.

**Jerry Ratcliffe:**

I'm going to cut that bit out, we're going to give you the credit.

**Adrian Raine:**

Okay. But anyway, we did this intervention, and we did find that the kids who went into the early intervention, they had a 34% reduction in crime at age 23 compared to the control group. We found that the kids in the intervention had two and a half extra child portions of fish every week compared to the control group. That put us onto the idea that maybe Omega-3, which is rich in fish, maybe one of the mechanisms at least, which might explain why the intervention worked. We even did a study in Singapore on young offenders, a randomized control trial. Giving the Omega-3 to young offenders, and lo and behold, we did get significant reductions in aggressive and antisocial behavior.

**Jerry Ratcliffe:**

What age group was that?

**Adrian Raine:**

They were aged 16 to 19.

**Jerry Ratcliffe:**

It's not just an early childhood thing. It's not just the case that the violence we see here in Philadelphia now is partly a result of poor nutrition 20 years ago. It could be as a result of poor nutrition a few years ago. It's still relevant while the brain is developing?

**Adrian Raine:**

Exactly. It's never too early and it's never too late to intervene in terms of changing the brain. Omega-3 is a long-chain fatty acid, which is critical for brain structure. If there is a brain basis to crime and violence, it stands to reason that maybe Omega-3 would work in terms of improving the brain and reducing impulsive antisocial behavior.

**Jerry Ratcliffe:**

I never thought in this podcast I would be having a conversation about long-chain fatty acids.

**Adrian Raine:**

This is the boring jargon that comes up in my area of research. An extra portion or two of fish every week would have the same benefits.

**Jerry Ratcliffe:**

Do you think that benefits people at any age?

**Adrian Raine:**

Yes.

**Jerry Ratcliffe:**

Those of us with low heart rates and low blood pressure like me?

**Adrian Raine:**

Yes, indeed. Earlier this year I published a meta-analysis of 28 randomized control trials, all of which gave Omega-3 to look to see does it reduce aggressive behavior? If you average up all those randomized control trials, there is a significant effect. The degree of the effect is reducing aggression by about 32%.

**Jerry Ratcliffe:**

That's not insubstantial. Is there an argument here for in the same way we put fluoride in water to improve people's dental care to start dropping a little bit of omega-3 in there?

**Adrian Raine:**

Well, this is where it comes to practice and where I think I failed. It's really not my decision, but the question is, would we be doing a better job in reducing future crime and violence by putting in a little bit more fish into the school diet? Putting a little bit more fish into the prison diet? The research would say it would. I think my job is to give out the knowledge and it's up to society to decide what to do with it.

**Jerry Ratcliffe:**

Yes. I don't consider that a failure on your part in the slightest. Where I think there's a failure, it's a failure of politics and it's a failure of society to pay more attention to this kind of stuff and to be prepared to make decisions that last longer than an election cycle.

**Adrian Raine:**

I would hope so, and I think that's one of the problems. I think that we would all agree that the vision of politicians is foreshortened inevitably by their job.

**Jerry Ratcliffe:**

You really are a father of the field of neurocriminology now, aren't you?

**Adrian Raine:**

I'd like to.

**Jerry Ratcliffe:**

Does that make you feel old?

**Adrian Raine:**

Maybe the grandfather of neurocriminology. I am old. But it makes me feel good to know that you and other people out there have some interest in what's always excited me more than 40 years of research that I've been conducting.

**Jerry Ratcliffe:**

Because you've had a couple of close shaves.

**Adrian Raine:**

I've had a couple of close shaves in my life. One of them was when I worked in prison. I remember, this is a top security prison. I got a call to see a prisoner. The prisoner is waiting for me. I was a bit late where I would go into the cell and wait for the prisoner to be brought to me. I got into the cell and I heard two people shouting and running right past my room. Then a lot of people ran past my room. What had happened is that, there was a new prisoner who wanted to see me. He got a iron bar and he wanted to beat my brains out. Because he wanted a life sentence. He had a five-year sentence. For some inexplicable reason he wanted to be a lifer.

**Jerry Ratcliffe:**

Yes. You don't strike me as a chap that inspires that level of venom and aggression.

**Adrian Raine:**

He picked a psychologist because he thought they're a little bit more status. But he got so frustrated waiting there with his bar, he just vented his anger on a prisoner.

**Jerry Ratcliffe:**

Good grief.

**Adrian Raine:**

That prisoner had permanent brain damage.

**Jerry Ratcliffe:**

Oh my goodness. Did it reinforce you the importance of the work that you do then?

**Adrian Raine:**

It really made me worried going to prison. I would get chest pains driving to prison knowing I'd come so close to something like that. Of course, this is what we want to stop.

**Jerry Ratcliffe:**

I think what you highlight is something that is not well understood that if you want real experience and understanding these kinds of fields, you've got to put yourself in these kinds of positions.

**Adrian Raine:**

Situations. It brings you closer to the summing of the victim. When we were talking about this issue of, oh, psychopaths, they do bad things, but should they be punished as harshly as they do? Well, that's the bleeding heart side of me. But the other side is when you get really close to being banged on the head with an iron bar and getting brain damage makes you think twice about the other side of the coin and how we need protection in society and should we be so soft on these offenders?

**Jerry Ratcliffe:**

Being victim centered is rare these days. I appreciate you for it.

**Adrian Raine:**

Yeah.

**Jerry Ratcliffe:**

You started off this saying that you thought this field was boring. Come on.

**Adrian Raine:**

It's fun. I've loved my career. I've loved my work. I'm still enjoying it. I'm going back to Mauritius in December. Can't wait.

**Jerry Ratcliffe:**

That's fantastic. I think we've covered pretty much everything.

**Adrian Raine:**

No, I think we've got to heart in the meat of the matter. We've had a lot of fun. I've enjoyed it, Jerry.

**Jerry Ratcliffe:**

I've had a fantastic time. This has been so much fun, cheers, Adrian.

**Adrian Raine:**

Exactly what you said it would be, and I'm very pleased.

**Jerry Ratcliffe:**

Thanks for spending the time with me.

**Adrian Raine:**

Good.



# REDUCING CRIME PODCAST TRANSCRIPT

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**Jerry Ratcliffe:**

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