

# — Between crime prediction and crime prevention

Transcription of the interview with Adrian Raine<sup>1</sup> - Ch. 1

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## 1. Criminal behavior: origins and causes

I've been working in the field for 40 years now, four decades, and I think it began with my PhD, which I conducted at the University of York in England. And there I was very interested in physiological arousal, the idea that we all differ in our degree of arousal. Some people have low arousal, some people have high arousal, some people are at the average level of arousal. Measures of arousal are things like heartrate, sweat rate activity, the technical term is skin conductance activity. Also, EEG, the electroencephalogram. It's a measure of the electrical activity of the brain.

### The very first study

In my very first study, I took these three measures of arousal in 15-year old schoolchildren, and I found that those boys with low levels of arousal were more antisocial, as reported by their schoolteachers. But more importantly, I followed them up for 9 years until they were aged 24, and what I found is that each of the three measures of physiological arousal predicted to criminal offending nine years later.

### Now, why is low physiological arousal related to criminal behaviour?

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Well, imagine you take a 15-year old schoolboy, you bring him into a laboratory, you put electrodes on him, he's never met me before, it's a little bit of an anxiety-provoking situation. And during that time, if, for example, you were normal, your heartrate would go up, you would sweat a little bit more, just like I am sweating a little bit with that camera on me even now. My brain will be more highly activated. That's if I respond to the fear anxiety provoking situation. But if I lack fear, if I am a fearless individual, my heartrate will stay low. That's why we were finding, I believe, that those schoolboys with low arousal in that situation are more likely to commit criminal acts nine years later, because if you have an appropriate level of fear, then you are worried about what will happen if I rob a store, what will happen if I cheat on my tax return forms. But if I lack that fear, I am more likely to steal, more likely to rob from a store.

Incidentally, social factors also predict to later crime, but we were finding that these biological measures are predicting over and above the social factors that go to make an individual more likely to become criminal. Going back then, another study we did, which I like, is a study of 4,000 babies. These were all babies born in Copenhagen, Denmark, in a certain hospital. We measured birth complications at the time of birth.

We followed them up into their first year, and we had social workers go to all the homes of the babies, interviewing their mother. And in the interview, we assessed whether the mother rejected the child, whether she did not want the child.

We followed up these 4,000 male babies for 18 years, and what we found is that it's when you get the combination of both birth complications and a social rejection of the child, that's when we got an exponential increase in violence 18 years later. The sample, with both of these factors, were three times more likely to become violent, and looking back at the work I have done, I think that was an important study in 1994, because it was the first convincing demonstration that biological factors conspire together with social factors very early on in life to raise the odds that somebody will become violent.

### **Another example: the 1994 study in murderers**

We studied 41 murderers. We brain-scanned them, compared them to 41 other murderers, and we found that poor functioning of the very frontal region of the brain, the prefrontal cortex, that characterised the murders as a group, compared to the normal individuals. And from a neurological standpoint, this makes sense, because this very frontal region of the brain is involved in checking impulsive behavior. When we feel like lashing out, it's the frontal cortex that says, "No, wait a little bit, maybe this isn't a good time, a good place, to strike". Also, the frontal cortex is involved in emotion regulation, regulating our emotions. We all get angry at times, don't we? You must all get angry, I get angry. What stops me lashing out is a good functioning prefrontal cortex that regulates my emotions, so that frontal cortex is like the guardian angel on behavior.

**“But if the guardian angel is asleep, as it is in murderers, then the devil can come out, people can get killed”**

*[to be continued]*