

# FAB RESEARCH NEWS

## 14 September 2003 - The Observer Diet of Fish 'Can Prevent' Teen Violence

**A new study reveals that the root cause of crime may be biological, not social, Gaby Hinsliff - chief political correspondent - reports**



Feeding children a diet rich in fish could prevent violent and anti-social behaviour in their teens, according to research to be announced this week which suggests the root causes of crime may be biological rather than social.

The study raises major questions over the extent to which criminals exercise free will, as well as fuelling fresh debate over whether simple childhood interventions might be more use in preventing crime than blaming parents or organising draconian crackdowns on crime.

Professor Adrian Raine, a leading psychologist at the University of California, will outline a growing body of evidence showing that violent offenders have physical defects in a part of the brain linked to decision-making and self-control - which may make them more likely to lash out.

Raine's latest research, to be unveiled this week in Sheffield, looked at whether brain deficits could be avoided by action in the early years when the tissue is still developing.

A group of three-year-olds from Mauritius were given an intensive programme of enriched diet, exercise and cognitive stimulation, which included being read to and involved in conversation. By the age of 11 they demonstrated increased brain activity on brain scan read-outs, and by 23 they were 64 per cent less likely than a control group of children not on the programme to have criminal records.

'This is not the silver bullet to solving crime and violence, but I think it's certainly one of the ingredients,' said Raine, a former prison psychologist.

'The take-home point is that the seeds of crime are sown early in life.'

The research comes amid passionate national debate over anti-social behaviour.

Last week the Home Office launched an unprecedented exercise to chart the extent of such problems over a 24-hour period in Britain,

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The media have largely focused on just one aspect of this study, resulting in exaggerated headlines like this one. Diet was only one element of the intervention used to 'enrich' the early environments of these children from Mauritius (many of whom were at risk of malnutrition).

Fish and seafood do provide key omega-3 fatty acids needed for a healthy brain, so it is a reasonable speculation that this may have contributed to the effects observed. But in this particular study, so might many other elements of the 'enrichment' programme, designed to boost social, emotional and language development. Interested readers should consult both the original paper:

- Raine et al. (2003) Am J.Psychiat, 160:1627-35. Effects of environmental enrichment at ages 3-5 years on schizotypal personality and antisocial behaviour at ages 17 and 23 years

and a randomised controlled trial published last year which showed striking reductions in the antisocial behaviour of young offenders following dietary supplementation only.

- Gesch et al. (2002) Br J.Psychiat, 181:22-28. Influence of supplementary vitamins, minerals and essential fatty acids on the antisocial behaviour of young adult prisoners

Those results could NOT be attributed to other factors. (However, in that study, fish oils were only a small part of the dietary supplements used, which included vitamins and minerals as well as fatty acids). Summaries of both these papers are available from [www.fabresearch.org](http://www.fabresearch.org)

# FAB RESEARCH NEWS

and MPs will this week debate calls for children as young as three to be taught social skills under a national programme similar to the literacy and numeracy hours that take place in schools.

All this reflects pressure in Downing Street for new pledges on universal childcare to help prepare children for later life. Former Welfare Minister Frank Field is to publish a book calling for police to act as 'surrogate parents' to those out of control.

However, Raine will tell a conference on Psychiatry and the Problem of Evil organised by Sheffield University that violent and anti-social behaviour is most likely to have a neurological basis.

Yet it may be triggered only when early brain impairment is combined with social factors such as breakdown in parent-child relationships.

His work first identified a distinctive pattern of damage to the prefrontal cortex in murderers, suggesting the mechanisms inhibiting aggression were impaired.

Raine then used magnetic resonance imaging to study the brains of people with less lethal anti-social personality disorders, and found an 11 per cent reduction in the volume of neurons - so-called grey matter - in their prefrontal cortex compared to the average. They also showed lower heart rates and sweated less when stressed, a sign of blunted emotional responses which could affect their ability to empathise with victims.

The research, published in this month's American Journal of Psychiatry, involved 100 Mauritian children and a group of around 350 control subjects not put through the programme. EEGs - scans of brain electrical activity - at the age of 11 found heightened activity compared to their peers: they were less likely to have criminal records and 35 per cent less likely to report having engaged in some criminal activity and got away with it.

**The most striking effects were observed in those most malnourished when they started the programme, Raine said, suggesting that the diet - unusually rich in fish - could be the crucial element.**

**'Could it be the exposure to increased omega 3 fatty acids, which we know are the building blocks of cell membranes, leads to better brain function which we did discern at age 11 - and better outcomes at 23?' said Raine.**

In the long term, it may be possible for surgeons 'to correct' violent behaviour by repairing damage to the frontal lobes, he argues. Although brain damage is emerging as a defence against murder charges in the American courts, Raine points out that even people with damaged brains retain some choice over their actions.

Raine said the research does, however, raise serious issues for people with anti-social personality disorders, who face being locked up whether or not they have committed a crime under proposed new British mental health laws, and for the treatment of violent offenders.

'We can't be letting murderers out of prison just because they have had a neurodevelopmental impairment, but it raises a question about the severity of punishing,' said Raine.

Unfortunately, brain scans alone cannot reliably predict violent tendencies.

Raine notes that of a study he completed of 41 murderers, one - a prolific serial killer - differed from the others by not only having an undamaged frontal lobe, but also unusual patterns of activity in other parts of the brain.

There was only one other scan like it in Raine's collection - his own.

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