nature news

Published online 30 October 2009 | Nature | doi:10.1038/news.2009.1050

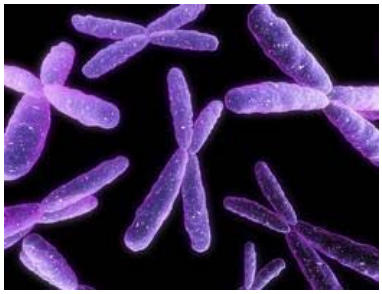
News

Lighter sentence for murderer with 'bad genes'

Italian court reduces jail term after tests identify genes linked to violent behaviour.

Emiliano Feresin

An Italian court has cut the sentence given to a convicted murderer by a year because he has genes linked to violent behaviour — the first time that behavioural genetics has affected a sentence passed by a European court. But researchers contacted by *Nature* have questioned whether the decision was based on sound science.



A court in Italy has cut a prisoner's jail term because he has genes associated with aggressive behaviour.

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Abdelmalek Bayout, an Algerian citizen who has lived in Italy since 1993, admitted in 2007 to stabbing and killing Walter Felipe Novoa Perez on 10 March. Perez, a Colombian living in Italy, had, according to Bayout's testimony, insulted him over the kohl eye make-up the Algerian was wearing. Bayout, a Muslim, claims he wore the make-up for religious reasons.

During the trial, Bayout's lawyer, Tania Cattarossi, asked the court to take into account that her client may have been mentally ill at the time of the murder. After considering three psychiatric reports, the judge, Paolo Alessio Vernì, partially agreed that Bayout's psychiatric illness was a mitigating factor and sentenced him to 9 years and 2 months in prison — around three years less than Bayout would have received had he been deemed to be of sound mind.

But at an appeal hearing in May this year, Pier Valerio Reinotti, a judge of the Court of Appeal in Trieste, asked forensic scientists for a new independent psychiatric report to decide whether he should commute the sentence further.

"There's increasing evidence that some genes together with a particular environmental insult may predispose people to certain behaviour."

Pietro Pietrini
University of Pisa

For the new report, Pietro Pietrini, a molecular neuroscientist at Italy's University of Pisa, and Giuseppe Sartori, a cognitive neuroscientist at the University of Padova, conducted a series of tests and found abnormalities in brain-imaging scans and in five genes that have been linked to violent behaviour — including the gene encoding the neurotransmitter-metabolizing enzyme monoamine oxidase A (MAOA). A 2002 study led by Terrie Moffitt, a geneticist at the Institute of Psychiatry, King's College, London, had found low levels of *MAOA* expression to be associated with aggressiveness and criminal conduct of young boys raised in abusive environments[1].

In the report, Pietrini and Sartori concluded that Bayout's genes would make him more prone to behaving violently if provoked. "There's increasing evidence that some genes together with a particular environmental insult may predispose people to certain behaviour," says Pietrini.

On the basis of the genetic tests, Judge Reinotti docked a further year off the defendant's sentence, arguing that the defendant's genes "would make him particularly aggressive in stressful situations". Giving his verdict, Reinotti said he had found the *MAOA* evidence particularly compelling.

Reinotti made the decision in September, but the case only came to light a month later when the local paper *MessaggeroVeneto* reported the story.

Weighing up the evidence

But forensic scientists and geneticists contacted by *Nature* question whether the scientific evidence supports the conclusions reached in the psychiatric report presented to Judge Reinotti.

"We don't know how the whole genome functions and the [possible] protective effects of other genes," says Giuseppe Novelli, a forensic scientist and geneticist at the University Tor Vergata in Rome. Tests for single genes such as *MAOA* are "useless and expensive", he adds.

One problem is that the effects of the *MAOA* gene are known to vary between different ethnic groups, Moffit says. A 2006 study in the United States found that former victims of child abuse with high levels of MAOA were less likely to commit violent crimes — but only if they were white. The effect was not evident in non-white children[2].

"If the defendant has any African ancestry, this could bring up a question of how well the genotype of that particular gene could relate to his

personal behaviour," Moffitt says.

Pietrini and Sartori, however, did not test Bayout for his ethnicity.

"The ethnicity of the defendant is irrelevant" in this case, Pietrini told *Nature*. He argues that the defendent does not belong to any of the non-white ethnic groups considered in the 2006 study. "Besides, *MAOA* is just one of the candidate genes we analysed," he added.

"If the defendant has any African ancestry, this could bring up a question of how well the genotype of that particular gene could relate to his personal behaviour."

Terrie Moffitt
Institute of Psychiatry

Other genes, such as those that encode the serotonin transporter, have also been linked to different reactions to stress. But these also show a large degree of dependence on environmental factors. "The point is that behavioural genetics is not there yet, we cannot explain individual behaviour, only large population statistics," says Nita Farahany of Vanderbilt University in Nashville, Tennessee, who specializes in the legal and ethical issues arising from behavioural genetics and neuroscience.

Cattarossi argues that all evidence that has a bearing on her client's mental health should be considered by the court. "My client is clearly an ill person and everything that allows the judge to better evaluate the case and to decide the right sentence should be investigated," she says.

Since the 1994 Stephen Mobley case in the United States — the first case in the world in which the defence asked to have their client tested for MAOA deficiency — lawyers have increasingly been trying to bring MAOA deficits and similar genetic evidence into courtrooms worldwide. According to Farahany, who updates a personal database on sentences passed in the United States, in the past five years there have been at least 200 cases where lawyers have attempted to use genetic evidence to support the idea their clients' were predisposed to violent behaviour, depression or drug or alcohol abuse. In Britain, there have been at least 20 such cases in the past five years.

Up to now most such efforts have been unsuccessful in court — although a few have influenced sentencing in the United States. Judges have tended to reject the idea that a person has no control over their choices because of their genes, says Farahany.

Some fear that such cases could lead to the acceptance of genetic determinism — the idea that genes determine the behaviour of an organism — in criminal cases.

"90% of all murders are committed by people with a Y chromosome — males. Should we always give males a shorter sentence?" says Steve Jones, a geneticist at University College London. "I have low MAOA activity but I don't go around attacking people."

Farahany points out that prosecutors could use the same genetic evidence to argue for tougher sentences by suggesting people with such genes are inherently 'bad'.

"The question is where do you stop," Jones adds.

References

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ISSN 0028-0836 EISSN 1476-4687