

**ARTICLE:** Pupils' school experiences help to explain whether or not genetic risk for offending becomes a life of crime

A research team led by Jasmin Wertz, Avshalom Caspi and Terrie Moffitt at Duke University and Kings College London reports that a genetic signature previously discovered in a genome-wide association study of educational attainment also predicts criminal offending. In particular, the genetic score also predicted the life-course persistent pattern of antisocial behavior that onsets in childhood and persists into adulthood. The genetic score was associated with these outcomes primarily because it influenced study participants' cognitive and self-control skills, academic difficulties, and truancy from school when they were young school pupils. This confirms that a child's experiences at school play a key role in whether or not s/he will go on to become an offender. Schools are the first institutions of social control that children encounter outside the family, which makes schools an ideal launching pad for crime prevention.

**PUBLICATION SOURCE:** Psychological Science.

**FINDINGS AND WHAT THEY MEAN:** We conducted our analyses in a 1994/1995 United Kingdom birth cohort of 2,000 participants followed into early adulthood, and a 1972/1973 New Zealand birth cohort of 1,000 participants followed into midlife.

(1) Genetic discoveries for educational attainment are not related to education only. The same genetics also predicted criminal offending: Study participants with a lower polygenic score for educational attainment were more likely to receive an official criminal record, compared to those with a higher polygenic score. The difference in risk was small. It is not possible to accurately predict who will become a criminal based on our findings - the majority of participants never received a criminal record, regardless of their polygenic score.

(2) Participants with a lower polygenic score for educational attainment were more likely to follow the life-course persistent pattern of antisocial behavior that onsets in childhood and persists into adulthood.

(3) Participants' greater risk of receiving a criminal record was foreshadowed by behavioural difficulties at a young age: as children, participants with lower polygenic scores had poorer cognitive and self-control skills, experienced more difficulties in school and were more often truant from school. These problems partly explained why some participants with lower polygenic scores went on to become involved in crime. Helping children develop better cognitive and self-control skills and improving their school experiences may prevent genetic influences on crime from unfolding.

**SUPPORTING DETAILS:**

**PARTICIPANTS:** Participants in the first cohort were members of the Environmental Risk (E-Risk) Longitudinal Twin Study, which tracks the development of a birth cohort of 2,232 British participants born in England and Wales in 1994-1995. The sample consists of 1,116 families with same-sex monozygotic and dizygotic twin pairs. Home-visits assessments took place when participants were aged 5, 7, 10, 12 and age 18 years, when 93% of the participants

took part. The study sample represents the full range of socioeconomic conditions in the UK. Participants in the second cohort were members of the Dunedin Multidisciplinary Health and Development Study, an investigation of the health and behavior of a representative cohort of 1037 consecutive births between April 1972 and March 1973 in Dunedin, New Zealand. This birth cohort's families represented the full range of socioeconomic status in the general population. Follow-ups have been carried out at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, 32, and most recently 38, when 95% of the living cohort members took part.

**DOCUMENTARY FILM:** We invite you to view a new documentary about the Dunedin Study, called "Predict My Future: The Science of Us," available via Curiosity Stream (<https://app.curiositystream.com/video/1268>).

**POLYGENIC SCORES.** We took a measurement of the genomes of our Study members using a technique called "polygenic scoring." Polygenic scores combine information from large numbers of genetic variants all across the genome to measure a continuum of genetic influence. We based the polygenic score on a recent genome-wide association study of educational attainment published by the Social Science Genetic Association Consortium (SSGAC).

**MEASURING CRIMINAL OFFENDING.** Participants allowed us to search their official records of criminal offending, through UK Police National Computer (PNC) record searches and searches of the central computer system of the New Zealand Police.

**MEASURING DEVELOPMENTAL PATTERNS OF ANTISOCIAL BEHAVIOR.** Antisocial behaviors such as physical fighting, bullying others, destroying property, telling lies, truancy, and stealing were assessed in the Dunedin cohort at ages 7, 9, 11, 13, 15, 18, 21, and 26 years through reports from parents, teachers, and study participants.

**MEASURING BEHAVIOURAL DIFFICULTIES AT A YOUNG AGE.** Cognitive skills were assessed during childhood using intelligence tests. Self-control skills were assessed during childhood using reports from parents, teachers, and study participants. Academic difficulties and truancy were assessed during childhood using teachers' and mothers' reports.

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**UNIVERSITIES INVOLVED:** Duke University, Durham, NC, USA; University of Otago, Dunedin, NZ; Institute of Psychiatry, Kings College London, UK.

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