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**Children's genes influence response to education**

Research from the Twins Early Development Study (TEDS) at the Institute of Psychiatry (IoP) King's College London, published today in PLoS ONE, has shown for the first time that measures used to judge the effectiveness of schools are partly influenced by children’s genes.

'Value added' is a measure of the progress students make over time between different stages of education.

It is a better indicator of a school’s quality than raw achievement because raw achievement is influenced by differences in pupil intake between schools.

The value added measure attempts to take into account differences in student background, including their genetic make-up.

Until now, the assumption behind these measures was that changes in student performance over time must be explained by the quality of the school nvironment.

**Twins Early Development Study**

Using data from the Twins Early Development Study (TEDS), the researchers were able to estimate how much of this measure of student progress is due to nature (genes) and how much is due to nurture (environments).

TEDS is one of the foremost ongoing twin studies in the world, including identical twins who share 100% of their DNA and fraternal twins who share 50% of their DNA.

If identical twins are more similar in their learning than fraternal twins then genetic influences are important.

Using data on school performance over time from 4000 pairs of twins, the researchers found that value added measures and other approaches to assessing school quality, are not affected by school environment alone but are also substantially influenced by genetic factors that children bring to the classroom.

Dr. Claire Haworth, a lecturer and interdisciplinary research fellow at the Social, Genetic and Developmental Psychiatry Centre, at King’s and lead author of the study said: *'These findings do not mean that educational quality is unimportant, environmental factors were just as important as genetic factors, however the results do suggest that children bring genetic characteristics to the classroom that influence how well they will take advantage of the quality of education offered.'*

She continues *'In a classroom full of students being taught by the same teacher, some children will improve more than other children, even though their educational experience at school is the same.'*

Future research will focus on identifying which characteristics allow a child to gain more from their educational experience.

Likely targets are motivation, persistence and self-control, all of which are already known to show genetic as well as environmental influence, and are likely to affect school learning.

Dr Haworth concludes:  *'This genetic perspective on education suggests moving away from thinking of children as passive recipients of knowledge in education, to an active view of learning in which children select, modify and create their own education in part on the basis of their genetic propensities.*

*The research supports the trend towards personalising education to each child's individual strengths and weaknesses.'*

The study, funded by the Medical Research Council (MRC), was conducted by scientists in the UK at the MRC Social, Genetic and Developmental Psychiatry Centre, at King's and in the US at the University of New Mexico.

'Added Value Measures in Education Show Genetic as Well as Environmental Influence' is published in *PLoS ONE*: Claire MA Haworth, Kathryn Asbury, Philip S Dale & Robert Plomin (2011). *PLoS ONE*.  The paper can be viewed [here](http://dx.plos.org/10.1371/journal.pone.0016006).

**Notes to editors**

**King's College London**

King's College London is one of the top 25 universities in the world (2010 QS international world rankings), The Sunday Times 'University of the Year 2010/11' and the fourth oldest in England. A research-led university based in the heart of London, King's has nearly 23,000 students (of whom more than 8,600 are graduate students) from nearly 140 countries, and some 5,500 employees. King's is in the second phase of a £1 billion redevelopment programme which is transforming its estate.

King's has an outstanding reputation for providing world-class teaching and cutting-edge research. In the 2008 Research Assessment Exercise for British universities, 23 departments were ranked in the top quartile of British universities; over half of our academic staff work in departments that are in the top 10 per cent in the UK in their field and can thus be classed as world leading. The College is in the top seven UK universities for research earnings and has an overall annual income of nearly £450 million.

King's has a particularly distinguished reputation in the humanities, law, the sciences (including a wide range of health areas such as psychiatry, medicine, nursing and dentistry) and social sciences including international affairs. It has played a major role in many of the advances that have shaped modern life, such as the discovery of the structure of DNA and research that led to the development of radio, television, mobile phones and radar. It is the largest centre for the education of healthcare professionals in Europe; no university has more Medical Research Council Centres.

King's College London and Guy's and St Thomas', King's College Hospital and South London and Maudsley NHS Foundation Trusts are part of King's Health Partners. King's Health Partners Academic Health Sciences Centre (AHSC) is a pioneering global collaboration between one of the world's leading research-led universities and three of London's most successful NHS Foundation Trusts, including leading teaching hospitals and comprehensive mental health services. For more information, visit: [www.kingshealthpartners.org](http://www.kingshealthpartners.org/)

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