

Emerging adulthood

It takes a lot longer to grow up these days. When I was growing up in Chicago in the 1950s, adulthood was what happened to most people right after secondary school (fewer than 10% of people went on to university). Most people were married by 23, most men got a job immediately after secondary school -- often a job that lasted for life -- and most women had children in their mid-20s (and over half never worked). This scene seems almost unrecognisable now in industrialised societies like ours. Half of the current generation go to university, there are few jobs for life, most women work, and the average age of a having a first child is 28. People in their twenties change jobs and their residence every other year on average. Two-thirds of couples live together before marriage. Birth control has for the first time in the history of mankind broken the link between having sex and having babies.

These dramatic changes in society have created a new uncharted stage of development called 'emerging adulthood'. This is the greatly

expanded stage of life when people in their late teens or twenties slowly and fitfully transition to independence as they leave home and make their own way in the world. This time warp also offers freedom to find fulfilling relationships and jobs. Instead of taking place in a year or two in the late teens, emerging adulthood stretches out through the twenties. 'Adulthood' seems far away -- and many young people are not all that sure they want to go there!



Little is known about this new life stage because it is such a recent phenomenon. Young people have to adapt to this new reality and there is no roadmap. We do know it is a period of great instability and uncertainty because the former lockstep march from schools to jobs to family is gone. TEDS is in a great position to contribute to our understanding of this

critical stage that can be a 'tipping point' for the rest of life -- for good or for bad. Because TEDS twins and their families have participated since infancy, TEDS has the opportunity to conduct pioneering research on the risk and protective factors responsible for good vs poor outcomes in emerging adulthood.

With the help of many TEDS twins and their families, the TEDS team are working hard to develop measures that will help us understand emerging adulthood. Towards the end of this year, we will be asking TEDS twins and their families to participate in this major study of emerging adulthood. This will be the climax of our 20 years of TEDS and I very much hope you will continue to contribute to TEDS when we contact you later this year.

- Prof. Robert Plomin (TEDS Director)



NEW LOGO, NEW WEBSITE, NEW APP, NEW PROJECTS!

TEDS has changed a lot through the years - many of you still remember our first logo - two toddlers sitting side by side. Now we are turning 21 and it's time for a change! Our **new branding** reflects the fact that TEDS is in a new stage and you are now young adults. Let us know what you think on Twitter @TedsProject.

To accompany our new logo, we also have a brand new **website: www.teds.ac.uk** which contains the latest news and announcements from TEDS. It will also link to **TEDS-21**, our

next wave of testing happening this year.

But wait, there's more! You spoke and we listened - we know you use your phones a lot, therefore we are developing a **new TEDS app!** This will be used for testing and everything will be accessible from your phone (as well as your computers)! The new app will be launched in September/October this year.

Finally, we are excited to announce our new study 'Children of TEDS' or **CoTEDS**. Read more about this new project over the page!



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As you grow up, so do we!

Children of TEDS



As TEDS twins become adults, increasing numbers will also become parents. More than 20 years since the twins were first enrolled as infants by their parents, we are excited to invite the twins to enrol in TEDS again - but this time as the parents!

TEDS have launched a new study called the *Children of TEDS*, or *CoTEDS* for short. The aim of CoTEDS is to collect data on the development of the TEDS twins' children. This will make TEDS the world's *first ever* twin study to include information on both twin parents and their offspring from birth. We will be able

to compare old data on the TEDS twins to that of their children at the same age. This will provide a unique opportunity to examine how different behaviours and traits are passed down through generations, with reference to the influence of both genes and the environment. We will also be able to study the roles that parents play in their child's development.

If you are a parent, or will soon become a parent, we invite you and your child/children to take part in CoTEDS. We are also keen to enrol the original TEDS parents onto CoTEDS, as grandparents!

Don't worry how much or how little you have been involved in the past, this is a new opportunity to be part of important, ground-breaking research.

If you are interested in becoming part of CoTEDS, please register for further information using our online enrolment form on the TEDS website, also available at:

<https://goo.gl/Cr7Kxy>.

Alternatively, get in touch by email, so that we can get back to you with more information.

We also really enjoy receiving photos!

TEDS in the news!

Genes influence academic ability across all subjects, latest study shows

Around 60% of differences in GCSE results can be explained by genes with the same genes responsible for maths, science and the...

The Guardian, July 2015

theguardian

THE SUNDAY TIMES

Boffin or artist? It's in the genes

The Sunday Times, June 2015

The Telegraph

'Children should be genetically screened at the age of 4 to aid their education,' expert claims

The Telegraph, Jun 2015

TEDS is quite frequently in the news. Sometimes the journalists get it right... and sometimes they don't, and they end up with titles that can mislead and misinform the public. At TEDS we believe that good science communication is very important, therefore we try to disseminate research in a way that is both accurate and accessible. As part of this, we have set up 'TEDS talks' short 5-minute

videos where we talk to TEDS researchers about their research.



If there is anything you would like covered in these talks, get in touch! You can find them on our website or on our YouTube page '[TEDS Project](#)'.



The Life Scientific

The Director of TEDS, Professor Robert Plomin, was interviewed for the prestigious BBC Radio 4 programme called *The Life Scientific*. The 30-minute broadcast is [available on BBC iPlayer](#) (search Robert Plomin on iPlayer Radio). TEDS features prominently in the interview, which highlights the importance of genetics in development, especially in relation to education.

Want to hear more?

You might also be interested in a [40-minute podcast](#) interview with Professor Plomin for *The Guardian's Science Weekly* on genetics within education called 'Should we genetically screen four-year-olds?'

He was also [interviewed](#) for the *Times Education Supplement* which can be found on YouTube (search TES Robert Plomin).

Current research in TEDS

DNA to discovery

Human behaviour is polygenic. That means: differences in behaviour between people are affected by a multitude of genetic variants, which individually have a minuscule effect, but together explain a substantial part of individual differences. Polygenic scores combine the effects of thousands of trait-associated DNA variants discovered by independent genome-wide association studies (GWAS) and together provide individual-specific estimates of genetic propensities for a trait.

In 3000 TEDS participants for whom we have DNA, we created 13 polygenic scores from the largest GWAS for psychiatric disorders (for example, schizophrenia, depression and dementia) and cognitive traits (for

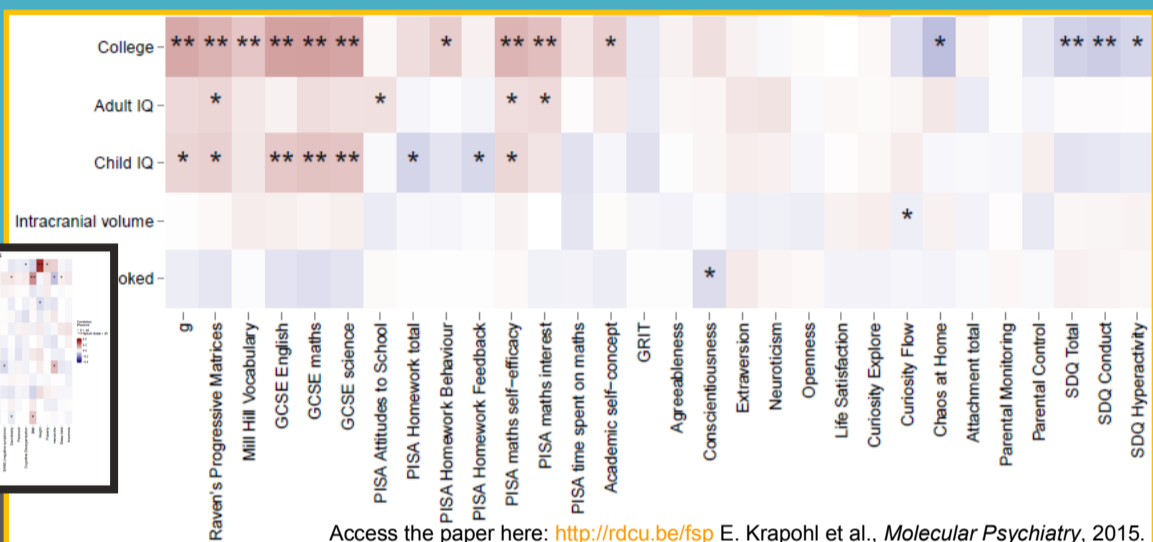
example, intelligence, educational attainment and intracranial volume). We then investigated association between these polygenic scores and 50 behavioural traits measured at age 16.

The small graph (below, left) shows the associations (red=positive; blue=negative; asterisk indicate which associations are most reliable statistically) between the 13 polygenic scores (vertical) and the 50 behavioural traits (horizontal).

The cognitive polygenic scores (big graph below), such as going to college

(university) showed many associations, for example those who had more university-associated DNA variants did better at GCSE maths and had fewer behavioural problems than those with the fewest university-associated variants.

So what does this mean? This research highlights the potential of using polygenic scores for prediction. As polygenic scores become more accurate, it will become possible to predict which children are going to find it more difficult to learn, or who are at a risk for future health problems, and intervene early to prevent.



Access the paper here: <http://rdcu.be/fsp> E. Krapohl et al., *Molecular Psychiatry*, 2015.

Spatial abilities

Spatial abilities include a diverse range of skills, covering everything from map-reading to recognising objects from different angles. These abilities are thought to be related to all kinds of important outcomes, including success in fields related to science, technology, engineering and maths (the so-called "STEM" subjects).

This area has been studied for many years, but is still not very well understood. It is not even known definitively how many different spatial abilities there really are - can someone be good at mentally rotating objects but not so good at map-reading, for example? If so, why?

What other abilities, traits or outcomes (such as choice of job) might these skills be related to? Are there genes or specific experiences that affect how these spatial skills develop, and might different influences come into play for different abilities?

Over the past year, TEDS has been conducting one of the largest and most comprehensive studies of spatial abilities ever conducted, with the aim of helping to answer some of these questions. Participants have completed many kinds of spatially-related activities, such as imagining or drawing scenes from different angles, mentally assembling objects from their component parts, and navigating around a virtual reality city.

The study is still in progress, and should be completed within the next few months. This is just one of the many areas in which the TEDS twins are helping to push the boundaries of scientific knowledge: once all the data are in, we hope to address some of the long-standing questions about this fascinating area of research – and, as always, raise some new ones!



A-level achievement and subject choice

Children differ widely in how well they do at school – while some seem to get A's with ease, others struggle and find school difficult. At TEDS we have already shown that this difference in school achievement is heritable, from the early school years until the end of compulsory education. This means that individual differences in children's school grades are to a large extent explained by the differences in their DNA sequence. Research also shows that genetic differences between

children influence how well they perform at school and also how easy or enjoyable they find learning in general.

At the end of GCSEs, teens can choose to continue on to A-level studies. Those that do face further decisions regarding subject choice.

Our recent study, using the A-level results of TEDS twins, concludes that choosing to do A-levels is attributable to 50% genetic differences, and 50%

environmental influences. There is an even stronger genetic influence on specific subject choice - 52-80%, all while the heritability of achievement continues to be substantial. Our results suggest that genetic differences influence both the appetite for learning (choosing to continue studies at A-level) and the aptitude for learning (achievement at A-level).

TEDS twin Rosa talks about 'Twindividuality'

You don't have to be an identical twin to have insight into what makes every individual unique, but it certainly helps! My interest in twin studies began with my participation in TEDS 21 years ago. Twins, I discovered, offer an elegantly simple scientific method for investigating the relative role of nature and nurture in influencing traits like behaviour, personality, and health.

My degree in Human Sciences at Oxford enabled me to engage with twin research. My dissertation sought to explain why identical twins can have very different academic achievement outcomes. Identical twins have the same genetic code, but the code is expressed differently depending on chance and

environmental factors, which can lead to important differences in various traits, including some affecting school achievement. In fact, twin studies offer the best evidence for the importance of the environment, which includes not only parent and classroom effects, but differences in the womb environment between a pair of identical twins. Genetics and environment combine to drive individuality. Identical twins might have early personality and health differences that cause people to respond to them differently, or lead them to seek out different environments.

Twin research into academic achievement is important: individual differences send children on different

lifelong pathways, affecting occupation, health and mortality. It feels great to not only be a 'guinea pig', but to be contributing to research into what makes every individual unique, even when they're 'identical'.



WELCOME TO THE TEAM



Yasmin joined the TEDS team in the autumn of 2015 as a Research Worker helping to set up the Children of TEDS (CoTEDS) study. Since joining the team Yasmin has been looking back at the questionnaires completed by TEDS

twins and their parents in the 1990s, and helping to decide which ones we will ask TEDS twins to complete again with their children! Yasmin has a BSc in Neuroscience from the University of Manchester and is hoping to start her PhD next year at the Social, Genetic and Developmental Psychiatry Centre, King's College London. Yasmin has especially enjoyed sampling the wide variety of lunch spots surrounding the TEDS office.

Saskia recently joined the team to do her PhD with TEDS at the Social, Genetic and Developmental Psychiatry Centre, King's College London after finishing her undergraduate degree in Psychology at Goldsmiths, University of

London. She is very grateful to all our TEDS twins who have sent in their DNA, as one of her projects involves analysing the DNA data to investigate why individuals differ in academic achievement and intelligence. In the future, she would like to look at the relationship between health, health behaviours, personality and intelligence. When she is not in front of a computer, Saskia enjoys cooking and travelling around the world.



Antony: Spitting in a tube in the name of science!!

Thomas: Being a spy for @TedsProject #twins

Jolene: #lifewithtwins we are growing up and moving away but put us together and our twin mood will appear

Sarah: I've played Spatial Spy and I've been appointed the title of All-Seeing Eye. Who says tests aren't fun? #TEDS @TedsProject

Sinéad: @TedsProject not only have I met another #Tedstwin I am also in a relationship with him

Just finished another of my TEDS Studies, really enjoy taking part in them!! Always look forward to the next one too #twins @TedsProject

Lauren: Currently watching the TEDS Project DVD with my twin!



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