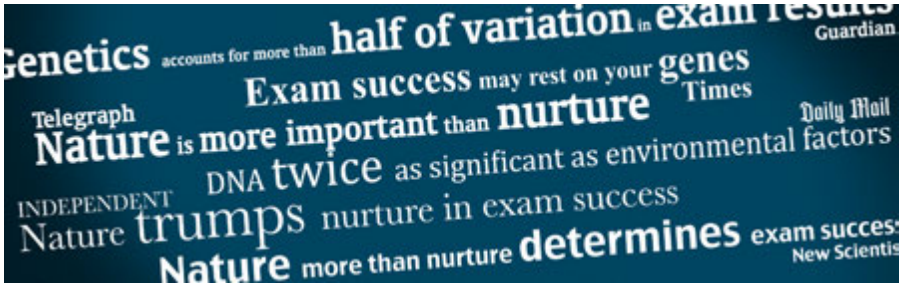
TEDS

SPRING 2014

THE NEWSLETTER FROM TEDS [TWINS EARLY DEVELOPMENT STUDY]

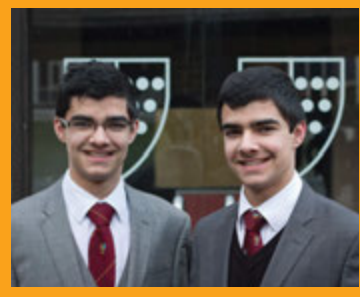
TEDS and Education

DURING THE PAST FEW MONTHS, you may have seen or heard that TEDS has been in the news. It's about educational achievement. Results from the data you have provided over the years have consistently shown that genetics is responsible for more than half of the differences in educational achievement during the school years, which is greater than for intelligence. We were keen to see the results for GCSE scores, which is why we have been asking for your GCSE scores. We have just published a paper by Nic Shakeshaft showing that differences on GCSE scores in all subjects are strongly influenced by genetics. It can be found at www.teds.ac.uk/publications.asp.



You can listen to some of the media coverage on BBC Radio's Today programme, Inside Science, and Night Waves, or read about it in any of the major newspapers. Again, links to all of the press coverage can be found on the TEDS website. In our scientific paper and in these interviews, we try to clear up misconceptions about what it means to say that half of the differences in GCSE scores are influenced by genetic differences. It does not mean that genes determine performance in a hard-wired way. Nor does it mean that half of your GCSE scores are due to your genes! It means that DNA differences are an important part of why some students get better GCSE scores than others, in addition to environmental influences such as families, schools and friends.

We hope that this media attention – especially after the publicity about our book G is for Genes (see last year's TEDS newsletter) – will start a conversation about the role of genetics in education, which has mostly been ignored until now. For example, the Director of TEDS, Professor Robert Plomin, gave a series of five lectures at the Department for Education and was invited to be a witness at the House of Commons Select Committee on Education. Although we emphasise that there are no necessary policy implications that follow from finding genetic influence, one general implication for education is to move away from a one-size-fits-all system to a personalised system that is sensitive to students' individual abilities and needs. Our book, G is for Genes, discusses these issues in detail ●



Similarity in practice: Dominic and Oliver Browne have both achieved Oxbridge success, gaining places to study at Cambridge and Oxford respectively. Dominic, who will read architecture, received his offer 5 days before his brother Oliver found out he was offered a place to read physics – a tense wait. Congratulations! ●

Sophie Hardy, a TEDS twin who recently received a copy of G is for Genes, expresses her thanks. 'Please pass on my thanks to Robert Plomin for the personally signed G is for Genes book - I am already a quarter of a way through the book and I am finding it very interesting!' ●

TEDS - the Twins Early Development Study

Recent TEDS papers

Here are a few of our most recent papers. You can find details of each of these, plus plenty more, on our website. All of these papers have come directly from the research you have taken part in. Thank you for all the hard work!

GENETICS OF PARENTING:

Types of parenting differ in how heritable they are. A recent TEDS study, based on the questionnaire data you provided, found a significant difference in the heritability of the positive and negative aspects of parenting, with the negative aspects yielding higher estimates. This finding suggests that negative parenting may be in

response to genetically influenced negative characteristics. In other words, the 'darker side' of personality seems particularly important in eliciting responses from parents. We hope understanding the cause of negative parenting may help to target interventions to improve parenting styles.

Oliver, B. R., Trzaskowski, M., & Plomin, R. (2013, December 23). Genetics of Parenting: The power of the dark-side. Developmental Psychology. doi:10.1037/a0035388

ADOLESCENT ATTACHMENT:

Findings from a unique study into adolescent attachment have recently been published. A sample of TEDS twins were interviewed about their relationship with their parents in order to estimate the genetic and environmental influences on later attachment. Most studies have focused on infant attachment, where the environment is more important than genes, and in particular the environmental factors shared by the twins. However, we found that in adolescence, genes seem to be much more important, accounting for 40% of the variance, and the environment that is unique to each twin is more important than the environment they share. Different factors therefore seem to be important for infancy and adolescence; whilst the quality of parental care is the primary factor influencing infant attachment, the picture is more complex in adolescence, as the genetically disposed characteristics of the child also play a major role.

Fearon, P., Shmueli-Goetz, Y., Viding, E., Fonagy, P. and Plomin, R. (2013), Genetic and environmental influences on adolescent attachment. Journal of Child Psychology and Psychiatry. doi:10.1111/jcpp.12171

PSYCHOTIC EXPERIENCES IN ADOLESCENCE:

Many symptoms of psychiatric disorders are thought to lie along a continuum, varying in severity throughout the population. We all experience a few of them. The behaviour questionnaire many of you filled out investigated how common symptoms of psychosis are. Indeed, these experiences seemed quite common, however, the majority of you didn't find this distressing. There were a couple of symptoms associated with distress, notably paranoid and cognitive disorganisation, which may prove useful markers for targeting help. As a next step we will investigate the genetic and environmental origins of these psychotic experiences. We also hope, with your help, to track these experiences over the next few years.

Ronald, A. et al (2013) Characterization of Psychotic Experiences in Adolescence Using the Specific Psychotic Experiences Questionnaire: Findings From a Study of 5000 16-Year-Old Twins. Schizophrenia Bulletin. doi:10.1093/schbul/sbt106

Face recognition

TEDS was one of the first scientific studies in the world to use the web for cognitive testing. It's the obvious choice for a large study involving participants living all around the country. Using the web allows us to measure things that couldn't be done by post or over the phone, so it greatly increases the kinds of research we can do. A recent example involved face perception. More than two thousand pairs of TEDS twins were asked to visit a purpose-built website and memorise photos, then to identify them amongst new photos, both for faces and other objects (cars). The ability to

recognise faces has long been considered 'special', in the sense that it seems to be largely unrelated to other abilities – including recognition of other types of object. Analyses are now in progress, and we expect the results to be very exciting – one of the most important things about twin studies is that they provide valuable insights into the genetic basis of traits, such as whether different abilities are influenced by the same genes, so this is an area where TEDS can make a real difference

TEDS - the Twins Early Development Study

SGDP Centre open day

The Social, Genetic and Developmental Psychiatry (SGDP) Centre recently celebrated its 10th anniversary. This beautiful building is where TEDS lives and was kindly funded by the Medical Research Council (MRC) to encourage the

collaboration of scientists from different disciplines to integrate social, genetic and developmental research with the goal of understanding nature-nurture interplay. The TEDS project plays a big role in the Centre, funded by the MRC, and has contributed many of the major findings. To celebrate this anniversary, combined with 100 years of the MRC, the SGDP Centre held an open day last summer for the public (including lots of children from the local primary school). Visitors took part in many interesting and fun activities

to learn about the brain, genes and their development, with scientists on hand to explain the different concepts. Guests enjoyed learning how to extract DNA, build their own DNA models and see their brain waves on an EEG machine. We even had two pairs of our very own TEDS twins to answer questions about what it is like to be part of a longitudinal research project. Thanks very much to George and Theo Dean and Jemma and Jennifer Abdul-Maliq Bello for their participation on the day. In fact Jemma and Jennifer attended the opening of the SGDP Centre 10 years ago and got to meet Princess Anne! The day was fully enjoyed by all who came, guests and staff alike, and we hope to do more in the future to engage a wider audience in our research ●

Nuffield study

Twenty-five years ago twin researchers made the surprising discovery that experiences that are NOT shared by children growing up in the same family are the ones that make most difference. Unique experiences like being bullied, having an inspirational teacher, falling in with the wrong crowd or stumbling on a hidden talent are more likely to make young people in the general population differ from each other than experiences which are the same for all children within a family.

Last year, in a study funded by the Nuffield Foundation, we asked a group of TEDS families of identical twins who were most different in their development about the experiences that they think were important. Since identical twins share all of their genes and their upbringing, any differences between them have to be caused by unique experiences. Five hundred families with identical twins completed questionnaires describing differences between the twins as they prepared to leave school, and sharing their ideas about the origins of those differences. We used this study to generate new hypotheses about the experiences that matter most. Since then we have interviewed 100 families in depth and are currently analysing their fascinating stories. We hope to use this research to identify new ways of supporting young people as they take their first steps in the adult world ●

Twins applying to university

Deciding what to do after leaving school can be a stressful experience. Being a twin can be an added pressure, particularly if both want to do the same thing. Paul and Alicia Winterton, parents of identical twins Jack and Tom, recount their nightmare experience of one twin receiving all the

university offers, whilst the other didn't get any. In response Alicia recognised the importance of the family being fully supportive of both twins getting the best grades possible. Paul recounted how he shared the emotions experienced by his sons; anger on one side and tempered elation on the other. Even Jack and Tom channelled their competitive instincts by using the disparity as motivation. They also fully supported each other throughout this stressful year. This paid off 6 months later. On results day, one got the grades he needed for his place at university, whilst the other also aced his grades, contacted universities and secured two places. This signifies the importance of keeping optimistic and supporting each other as a family. A happy ending! ●

TEDS

Welcoming new TEDS PhD students

Nic is investigating the relationships between different cognitive abilities, as well as exploring some of their real-world effects, such as educational and health outcomes. He designed the online face recognition study and is interested in how genes may influence how we perceive the world. His route was a little non-traditional, as he started off studying law, but he has no regrets embarking on a career in behavioural genetics research.

Eva studied developmental psychopathology and neuroscience at UCL and Yale. She is interested in how genes influence the way we select, shape, and modify our environment, and thereby shape our developmental trajectories. Presently, she is investigating developmental predictors and outcomes of educational achievement.

Kaili initially embarked upon a career in business, but after taking a break to have two children, she returned to university, gaining a BSc in Psychology and MSc in Developmental Psychology from Birkbeck University. She is interested in gene-environment interplay in cognitive development and educational achievement. Presently, she is investigating why educational achievement is so highly heritable at the end of compulsory education.

Yao is a visiting PhD student from Pennsylvania State University, who is finishing his PhD dissertation this summer. He is interested in examining the genetic and environmental influences in human development and change across life span, particularly on antisocial behaviour and substance use. While visiting, Yao is conducting an innovative pilot study with some of the TEDS twins called the Daily Mood Study that will follow and record participants' daily mood for 40 consecutive days ●

The future of TEDS: online testing

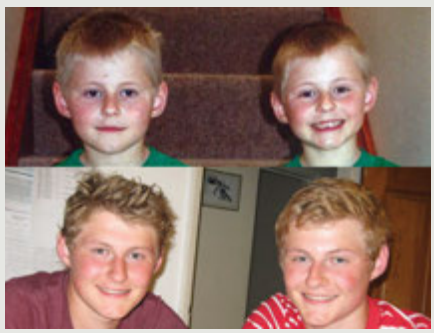
We think that conducting studies online like this is the future, both for TEDS and for scientific research in general, and we are very keen to make the most of it. We have lots of exciting ideas about the kinds of studies we can run – and of course that's where you come in! We hope to invite more of you via email to take part in future online studies and therefore are asking for your email address. We are even holding a prize draw for each twin pair who both send us their email addresses. You can still take part even if we already have your email address. Take a look at the flier enclosed with this newsletter. Please note you are under no obligation to take part in the studies once we receive your email, we just hope this will make it easier for us to contact you. We'd love it if you got in touch! ●

TEDS and Twitter

TEDS has very much enjoyed being on Twitter for the past year. We have loved reading your highlights of being part of the TEDS project, your interest in our research and seeing all the photos you

have sent in. Recently we put out a request for 'time-lapse' photos, showing our twins as children and as emerging adults.

Here are some of the ones you kindly sent in, nicely demonstrating how even identical twins can still look somewhat different despite sharing 100% of their DNA.



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