

Evaluation Summary	
Age range	Secondary (Year 11)
Number of pupils	2,300
Number of schools	42
Design	Randomised controlled trial, with randomisation at the school level.
Primary Outcome	GCSE results in Maths, English and Science

## **BACKGROUND**

### *Policy context and rationale*

There remain very substantial inequalities in educational outcomes in England: children from poor families are about half as likely as their more affluent counterparts to achieve at least 5 good passes at the end of compulsory schooling. This is despite greatly increased expenditure on education: the first decade of the Labour government in the UK produced a 56 percent real increase in school budgets, with very large rises for the most deprived schools. The primary project aim is to establish whether the interventions tested have a causal impact on student attainment. Our focus is the causal role of effort on educational attainment and we will seek cost-effective ways, through both pecuniary and non-pecuniary incentives, to increase effort. The interventions mesh with the Coalition Government's growing interest in the use of Randomised control trials to determine public policy, and its stated intention to "find ways of encouraging, supporting and enabling people to make better choices for themselves"<sup>1</sup>. As this intervention is conducted in the final year of compulsory schooling<sup>2</sup>, it will generate evidence on whether it is possible to alter student outcomes relatively late on in the Secondary phase of education. The research team's work draws on insights from the growing body of academic research in the fields of behavioural economics and psychology which show how often subtle changes to the way in which decisions are framed can have big impacts on how people respond to them. Both interventions cost less per pupil than the Pupil Premium, so if we find them to be effective and cost-effective, they are certainly feasible for schools with many disadvantaged pupils to introduce.

### ***Scientific background***

<sup>1</sup> Behavioural Insights Team Annual update 2011-2012 [http://www.cabinetoffice.gov.uk/sites/default/files/resources/Behavioural-Insights-Team-Annual-Update-2011-12\\_0.pdf](http://www.cabinetoffice.gov.uk/sites/default/files/resources/Behavioural-Insights-Team-Annual-Update-2011-12_0.pdf)

<sup>2</sup> Prior to RPA <http://www.education.gov.uk/childrenandyoungpeople/youngpeople/participation/rpa>.

The project has been designed on the basis of existing knowledge of what works well. Some of this evidence is drawn from the UK, but much has had to be read across from US schools. Our analysis will extend the available evidence base in the following ways:

Firstly, testing the use of pecuniary incentives is well-trodden ground in the US (see for example Angrist et al, 2009; Angrist & Lavy, 2009; Fryer, 2011; Levitt, List, Neckermann, Sadoff (2012) using different designs). Several small-scale local schemes to reward students for school attendance, activities or outcomes have been introduced in England, including attendance schemes in Southwark, Newcastle and Swansea; and a scheme that rewards achievement in Bristol (see Trouton et al., 2005 for a review of these schemes). However, none has been evaluated using a robust evaluation approach. Our approach aims directly to improve attainment in GCSEs and is targeted on disadvantaged schools to reduce any deadweight loss.

Secondly, the use of non-pecuniary incentives in education is less well trialled and evaluated. While the impact of descriptive social norms (Dolan and Metcalfe, 2011), priming (Dijksterhuis & Bargh, 2001), ego (Mullainathan and Washington, 2009), and pre-commitment (Thaler & Sunstein, 2008) all have some good field evidence, there is as yet little evidence in an educational context.

#### **INTERVENTION**

The research project is based around two different incentive schemes to reward pupils for effort. We randomised our schools cohort into two treatment arms and a control group.

**Arm 1: Pecuniary Treatment:** Pupils are given half-termly incentives in the Autumn and Spring Term for good behaviour. These good behaviours are: of coursework/homework, classwork; attendance at school; and not being disruptive in the school.

**Arm 2: Non-Pecuniary Treatment:** Pupils are rewarded with points every half term for good behaviour. Categories of behaviour and measures are identical to those in the Pecuniary Treatment. Points accumulate over two half-terms. If a pupil accumulates sufficient points over the two half terms, s/he is rewarded by accessing an event at the end of each half term. Events are arranged at the end of the Autumn and Spring term, but points awarded each half term to reinforce the notion of loss aversion and help the pupil link effort to reward. To enhance their affiliation to the project, teachers met with Year 11 pupils so that they could select events. Schools are using various measures to create and sustain enthusiasm for continuing to strive for their rewards among their pupils. We are conducting school surveys to identify reward schemes currently in place so that we can take these into consideration when researching project outcomes. We are conducting two surveys to measure pupil motivation during the initial and concluding phases of the project. We believe it will also be very useful to gather some limited qualitative data on how the experiment was

perceived. This type of information is often critical to understanding compliance rates and why particular interventions did or did not work effectively.

## **RESEARCH PLAN**

### ***Main research question***

Did intervention at year 11 raise GCSE performance?

### ***Sub-questions:***

- I. Did intervention improve the four identified behaviours;
- II. Which groups respond most or least to the incentives;
- III. Is it a cost-effective strategy/study?

The pupil cohort comprises year 11 pupils studying Maths, English and Science.

We used NPD data and the IDACI index to identify schools in disadvantaged areas displaying a range of similar characteristics across pupil cohorts. These characteristics included school structural factors; school average pupil characteristics; school performance indicators; and school income. We removed any schools which were either in, or due to go into, special measures. The randomisation had a block structure; blocking variables included minority ethnic groups in the school and whether the school already operated an incentive scheme.

### ***Sample size calculations***

We were required to randomise at the school-year level as opposed to the individual level for this experiment, and were obviously also constrained with respect to resources. At the time of study design we also did not have access to appropriate input data. With all this in mind, we calculated that we would need 2,300 pupils in each treatment group to show a 0.2SD change in the output (i.e. GCSE score).

### ***Measures taken to ensure blinding at randomisation, and prevent contamination between groups during implementation***

Details of the potential cohort and the intended project were provided to a team of external consultants whose activity was co-ordinated by the Project Manager. This arrangement protected researchers from any interaction from which a judgement about school preference could have arisen, and enabled researchers to benefit from experienced practitioners in the schools sector. The short lead-time from recruitment of schools to implementation, which straddled the summer holidays, required the team to train staff in schools in the project methodology and standard operating protocols prior to randomisation.

All communications during project implementation have been managed through the University's VLE which enables information and communication to be fire-walled at a variety of levels: at project level, where communications are generic across all treatments; within groups; where communications are only pertinent to the particular group; and within schools so that no school can identify or communicate with any other group within the project. Using the VLE in this way assures privacy of sensitive data and prevents contamination between groups

### ***Analysis plan***

We will merge in NPD data on student test score outcomes and use standard econometric techniques consistent with our research design to analyse. We will analyse variations by a range of student and school characteristics.

### ***Process evaluation methods***

The Project Team is undertaking visits to schools to conduct semi-structured interviews with key staff.

### **PERSONNEL**

- **Rebecca Allen** is a Reader in The Economics of Education at the Institute of Education, UK. She is also a Research Associate at the Centre for Market and Public Organisation (CMPO) and is a member of the Centre for Understanding Behaviour Change (CUBeC). Her research focuses on secondary schools and the effect of government policies on their behaviour and performance. Areas of research interest include school admissions policies and parental choice of school; school accountability and governance; competition between schools; school expenditure and teacher labour markets. She is experienced in collecting data from schools and combining this data with large-scale administrative datasets.
- **Simon Burgess** is Professor of Economics in the Department of Economics, University of Bristol. Simon is Director of [the Centre for Market and Public Organisation \(CMPO\)](#) and also the Director of The Centre for Understanding Behaviour Change (CUBeC). His current research interests are in the economics of education, including market-based education reforms such as school performance tables, school accountability, choice and competition, admissions and unequal access to high-performing schools, and the central role of teachers in education production.
- **John List** is the Homer J. Livingstone Professor in [Economics](#) at the [University of Chicago](#). From May 2002 to July 2003 he served as Senior Economist, President's Council of Economic Advisors for Environmental and Resource Economics, where he worked on multi-national market institutions to address climate change, the Clear Skies Act, the OMB benefit cost guidelines, and the softwood lumber trade dispute between the US and Canada. In July 2010, List was awarded the highest honour by the [AAEA](#), the [John Kenneth Galbraith](#) prize.

In January 2011, List was awarded an Endowed Professorship at the University of Chicago's Economics Department for his work in the area of field experiments. His work generally focuses on [microeconomic](#) issues, and in particular he uses field experiments using various different markets to obtain data, including grammar and high schools. The latter work is funded by the Griffin Early Childhood Center (GECC) in the U.S.

- **Steven Levitt** is the William B. Ogden Distinguished Service Professor of Economics at the University of Chicago, where he directs the Becker Center on Chicago Price Theory. Levitt received his BA from Harvard University in 1989 and his PhD from MIT in 1994. He has taught at Chicago since 1997. In 2004, Levitt was awarded the John Bates Clark Medal, awarded to the most influential economist under the age of 40. In 2006, he was named one of Time magazine's "100 People Who Shape Our World." Levitt co-authored *Freakonomics*, which spent over 2 years on the New York Times Best Seller list and has sold more than 3 million copies worldwide. His recent work has been focused on using field experiments to analyse and understand economic behaviour. This work has also been funded by the Griffin Early Childhood Center (GECC).
- **Robert Metcalfe** is the Postdoctoral Research Scholar in Economics at the Becker Friedman Institute for Research in Economics, University of Chicago. He is interested in developing and testing economic and behavioural theory using naturally occurring data and field experiments. He has conducted a number of field experiments in education, energy consumption, charitable giving, non-market valuation, resource use and savings. He has also worked on the measurement of welfare for option appraisal.
- **Sally Sadoff** is Assistant Professor in Management and Strategy at the University of California San Diego. Her research focuses on experimental economics, education and development, and is currently conducting research on closing educational achievement gaps through early childhood interventions, teacher merit pay, and performance-based incentives for students and parents. She is also conducting research on financial decision-making in poor households, including the use of information and incentives in cellphone banking and the effect of financial education on consumption and savings.

#### **TIMELINE**

##### **2012**

April	Contract finalised; Senior Project Manager and consultants recruited (Principal Investigator; University Contracts Team and Finance Team)
May	Recruitment strategy piloted and confirmed (Senior Project Manager and Consultants)
May/June	Cohort Recruited (Senior Project Manager and Consultants)

July	Initial training event for schools (Principal Investigator, Senior Project Manager, Consultants)
August	Preparation of project architecture, standard operating procedures, IT infrastructure (Senior Project Manager) Preparation of materials for schools (Research Team, Senior Project Manager)
September	Follow-up training event (Senior Project Manager & Principal Researcher); Introduction of project to Year 11 cohort to parents (reverse consent forms and in-school introduction from senior school staff; School survey to identify parallel interventions in schools for use in analysis of outcomes;
October	Data Collection 1: Finance Group receive first payment and feedback letters; Event Group receive feedback letters indicating points won towards Christmas Event. (Project Team)
December	Data Collection 2: Finance Group receive second payment and feedback letters; Event Group receive feedback letters, summary of achievement over both terms and initial event.(Project Team) Initial Pupil Survey circulated to collect information about pupil motivations (Research Team and Project Team)

### 2013

February	Data Collection 3: Finance Group receive third payment and feedback letters; Event group receive feedback letters indicating points won towards Easter Event (Project Team)
Easter	Data Collection 4: Finance Group receives fourth and final payment and feedback letters; Event group receive feedback letters, summary of achievement over both terms and initial event. (Project Team) Follow up Pupil Survey circulated to collect information about pupil motivations (Research Team and Project Team)
Sep 13/Aug 14	Researchers collect NPD data/GCSE outcomes Analysis of NDP Data Research write-up and dissemination

### RISKS TO THE EVALUATION

- Attrition among schools as a result of workload. To address this, we:
  - simplified the data collection process by:
    - requesting data which would typically be gathered in schools for the purposes of improving school performance;

- requesting data which is standard reporting data relating to attendance and behaviour;
  - requesting data in a binary form (achieved or failed to achieve threshold) in a format which had been subject consultation with all stakeholders;
  - providing comprehensive training and supporting documentation, in both written and electronic form;
- provided a dedicated project team for school support;
- built an on-line environment dedicated to supporting each group;
- Harvested feedback from schools at each stage and reviewed our standard operating procedures to enhance and assure provision of customer service.
- Attrition among schools as a result of staff changes. To address this we:
  - Offered one-to-one training by telephone or visit to the school and worked with project liaison, Year Heads and IT staff to support the transition
- Pupil engagement. To address this we:
  - Wrote to each pupil via the school to tell them about the scheme, the reward that had already been set aside for them, and what they had to do to secure the reward;
  - Asked the school to introduce the scheme to the pupils when they distributed the letters;
  - Asked the school to enthuse pupils in lessons and at the time of half-termly results; engage those pupils who had failed to secure their reward so that they continued to feel enthusiastic and positive;
  - Wrote to each pupil via the school with their individual results;