

Evaluation Summary	
Age range	Secondary (Year 7)
Number of pupils	c.240
Number of schools	4
Design	Regression Discontinuity Design
Primary Outcome	Reading

### ***SHINE in Secondaries Durham University evaluation protocol***

#### **Significance and rationale**

*SHINE in Secondaries* (a Saturday school transition programme) targets disadvantaged and underachieving children in year 7 to support literacy, numeracy, the development of good social networks, social skills and improved self-confidence in the transition between primary and secondary school. The intervention was developed from the most promising elements of the primary supplementary school intervention *SHINE on Saturday*, and is focused on children who are not predicted to achieve level 4 at KS2.

The rationale for this evaluation is based on the significance of the widely implemented *SHINE on Saturday* intervention, which has evidence of promise from the last nine years of implementation and evaluation using a pre-experimental design. This independent evaluation of the *SHINE in Secondaries* intervention will use a rigorous design and robust methods to establish effectiveness. The evaluation will focus on establishing an unbiased estimate of effect of the intervention on the short-term academic outcomes (literacy and numeracy) and social outcomes using a regression discontinuity design (Shadish et al, 2002).

#### **Research Plan**

The intervention comprises being offered *SHINE in Secondaries* (25 weeks of Saturday mornings x 4 hours for approximately 60 pupils per school in year 7, running from November to July).

#### **Research questions**

- (1) What is the impact of *SHINE in Secondaries* on literacy, numeracy and social skills outcomes?
- (2) What are the organisational implications and lessons for future wider role out?

#### **Design**

The design is regression discontinuity design (RDD) with two cut points pre-specified before pre-test (Shadish et al, 2002). Assignment of pupils to the intervention (*SHINE in Secondaries*) will be on the basis of falling *below* the first 'cut point' on the pre-test (assignment variable); assignment to the control group will be on the basis of falling *above* the second cut point on the pre-test (assignment variable). Pupils below the first cut point will be eligible to receive the intervention; pupils falling above the second cut point will not

be eligible to receive the intervention. Pupils falling between the two cut points will be eligible to receive the intervention only if a place becomes available due to lack of uptake from a pupil on the eligibility list. These pupils will be randomly placed on a waiting list to receive the intervention should further places become available. The pre-test (assignment variable) will be score on Progress in English 11. The design can be represented as follows:

OA C1 X O2

OA R X O2

OA R O2

OA C2 O2

Where OA is the pre-assignment measure of the assignment variable; C1 and C2 indicate that pupils are assigned to intervention or control condition on the basis of cut points in the pre-test; R indicates that pupils are assigned to waiting list for intervention randomly to ensure an unbiased estimation of effect of the intervention. X indicates the intervention and O2 is the post-test measurement. The analysis will regress the post-test on the pre-test for the entire cohort. Effect of the intervention will be estimated at median pre-test measures of waiting list, assuming approximately half of the pupils on waiting list received the intervention. An effect will cause an upward or downward ‘discontinuity’ in the regression line (Shadish et al, 2002) exactly at the point the cut off determines whether the pupils are in intervention or control condition. Figure 1 illustrates a regression discontinuity design for evaluation of SHINE on short term academic outcomes. The design assumes a linear functional form between pre- and post-test measures with constant slope for both the intervention and the control groups. Due to randomisation to waiting list, effect of the intervention is captured by discontinuity gap at median pre-test scores of waiting list between the two cut points (Trochim, 1984).

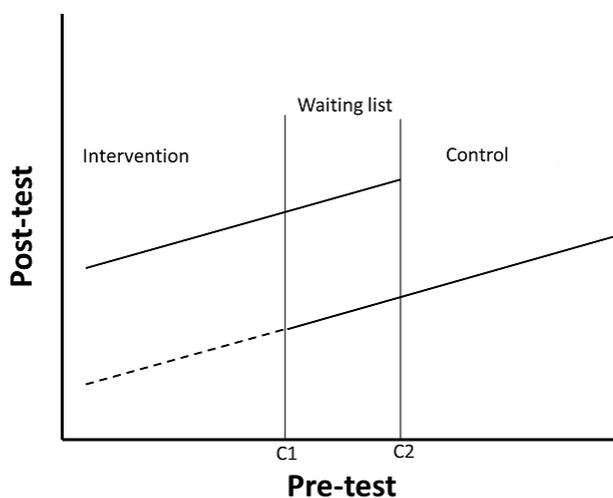


Figure 1: Illustration of regression discontinuity design for shine evaluation

In 2013-14 there will be 4 secondary schools with a total of approximately 120-250 pupils in each school (in year 7). The pupils selected in each school will be below the first cut point.

The RDD design allows causal inference to be derived unlike other non-randomised designs. However, there are some limitations to the approach. First, it is less powerful than a RCT, as to get the same power we would need approximately 2.75 times more pupils than a RCT. Second, there needs to be a clean break at the intervention cut-off. If some pupils below the

first cut point do not get the intervention, then this introduces a ‘fuzzy’ RDD and inference and power are weakened. Finally, the design also assumes that there is a linear relationship between the pre- and post-test. If there is another functional form of relationship then this may produce a biased estimate.

### ***Outcome Measures***

The primary outcome measure will be achievement in literacy (PiE 12). Secondary outcomes will be numeracy (PiM 12) and social skills.

### ***Analysis***

The primary analysis will be by intention to treat, i.e. those children selected to be offered the intervention will be analysed in the intervention group, whether or not they accepted the offer of the intervention and received the intervention. Generalized linear models (GLM) with centred pre-test measures (by subtracting median pre-test measures of waiting list from all pre-test cases in the analysis) and an intervention variable as predictors will be used to estimate the effect of the intervention on short-term academic outcomes assuming constant slope between pre- and post-test measures. By subtracting the median of waiting list, the regression discontinuity gap is shifted to the intercept reducing the analysis to a classical regression model. If none of the pupils on waiting list receive the intervention, the analysis will be done by estimating the effect of the intervention at the first cut point (by subtracting the first cut point from all pre-test cases in the analysis).

Secondary analyses will be performed to check the assumption of constant slope by including interaction between pre-test and intervention variable in the models. Change in estimate of effect of the intervention should be negligible if the assumption of constant slope holds. Effect of ‘fuzziness’ around cut points will be sensitized by excluding pupils on waiting list from the analyses; this approach has less statistical power than the primary analysis (Trochim, 1984). Effect of median pre-test measures will also be investigated by comparing the results to when mean pre-test measures of waiting list is used. In case of non-linear functional form between pre- and post-test measures, a semi-parametric model based on splines will be used to investigate the effect of functional form on estimate of effect of the intervention.

### ***Process evaluation***

A cross sectional design using interviews, focus groups and site visits (observations) will be used to assess the organisational and management issues with the primary aim of informing longer term wider roll out plans.

### **Roles of partners**

#### ***Developer***

The Developer (*SHINE*) will agree to the independent evaluation and provide a detailed description of the intervention.

#### ***School participation***

In order to be eligible to receive *SHINE in Secondaries* we will put in place a memorandum of understanding with the schools which will specify the following:

- Schools agree to be in the independent evaluation
- Schools agree to send parental opt-out letters to all pupils in year 7 in September
- Schools agree to pre-testing of all children in the study in September
- Schools agree to offer *SHINE in Secondaries* to eligible pupils ***identified by the evaluators*** using pre-specified criteria

- Schools agree to post-testing of all children in the study at the end of the school year

### **Personnel**

Carole Torgerson\*, Andy Wiggins\*, Victoria Menzies\*, Kirsty Younger\*, Adetayo Kasim\*,  
Mona Kanaan+, Catherine Hewitt+

\*Durham University

+University of York

Protocol approved by

- EEF: 25<sup>th</sup> July 2013
- SHINE: 8<sup>th</sup> July 2013

**Carole Torgerson**

**260713**

### **References**

Shadish, W.R., Cook, T.D. and Campbell, D.T. (2002) *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*, Boston: Houghton Mifflin Company.

Trochim, M.K.W., (1984) RESEARCH DESIGN for PROBLEM EVALUATION: the regression-discontinuity approach. London: SAGE Publications, Inc.