Increasing students' aspirations: the impact of a role model on students' educational attainment Pre-Analysis Plan Amendment Two

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1 Introduction

This analysis plan amendment pertains to additional data collection associated with the trial "Increasing students' aspirations: the impact of a role model on students' educational attainment."[1] In this trial, I test whether students seeing an aspirational movie, *Queen of Katwe*, increases their performance on national exams, as set out in the original pre-analysis plan.

Additionally, as outlined in this amendment, I will test whether seeing the movie *Queen of Katwe* also lead to students being more likely to remain in education, their subject choices and impacts exam scores two years after the intervention.

This amendment should be read alongside the original pre-analysis plan. All analysis detailed in this amendment will be carried out upon completion of the additional data collection in July 2019.

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[1]See http://www.socialscienceregistry.org/trials/1832 for the trial registration and https://www.socialscienceregistry.org/docs/analysisplan/957/document for the original pre-analysis plan and https://www.socialscienceregistry.org/docs/analysisplan/1220/document for the first pre-analysis plan amendment

2 Additional Outcomes of Interest

The sample of students at the time of the intervention in October 2016 included two different year groups: one in S4 aged approximately 16 and one in S6 aged approximately 18. Those in S6 left school after their final exams, and outcomes relating to whether they went to University have already been outlined in the previous pre-analysis plan. Those in S4 had the choice after their exams to either leave or remain in school. For those who remained in school, they could choose the three principal subjects they would specialise and take exams in two years later.

Outcomes relating to students who were in S4 at the time of the original study and their decisions to stay in school, their subject choices and their exam performance at the end of upper secondary school were collected in July 2019. These outcomes are being obtained directly from the original sample of schools. This data will be used to make the following additional outcome variables relating to school and subject choice:

1. An indicator for whether the student sat the final leaving exam (UACE)
2. An indicator for whether the student chose maths as a principal subject
3. An indicator for whether the student entered upper secondary school

Additionally, their performance in the final leaving exam, UACE, will be examined in the same fashion as for the original sample of students taking the UACE exam immediately after exposure to the intervention. As detailed in the original PAP:

The UACE is taken in 5 subjects, 3 of which are from a list of principle subjects, one in a subsidiary subject out of mathematics or computer, and one in a general paper. The subsidiary subjects and general paper are graded on a 1-9 scale, with 1 being the best and 9 the worst grade. Grades 7 and above are fails. Any student achieving a 6 or below on a subsidiary paper or the general paper gets one point. The principal papers are marked on a A,B,C scale, with an A earning 6 points, a B 5 points etc. The maximum of 2 points earned on the subsidiary and general paper are added to the points earned on the principal papers. This means the highest total score a subject could earn is 3 As and passes on the subsidiary and general paper, giving 20 points.

Standardised test scores will be constructed for each subject by subtracting the mean and dividing by the standard deviation of the control group. An overall index of exam performance will be calculated by summing test scores across all subjects and renormalising.

For students taking UACE exams the following outcomes will be examined:

1. **Total exam score**: Aggregate exam score composed of exam scores across all principal and subsidiary subjects taken by a student, with subsidiary subjects scored in points.
2. **Principal score**: Aggregate score in the three principal papers only.
3. **General paper and subsidiary paper score**: Standardised score on the general paper and subsidiary paper in maths or computer taken by all students. This will be an inverted scale of the 1-9 score on these papers.

Additionally, I will examine whether students achieved the required two passing grades in principal papers to meet the minimum standard of public university. Public University in Uganda is the best type of tertiary education and the grades required are set nationally. The requirement is passing grades in two principal subjects, where a pass is any score greater than 0. I therefore construct a dummy variable equal to one if a student got at least two passes in their principal subjects and zero otherwise.

2.1 Estimation and testing

I will estimate an ANCOVA specification of the following form:

$$y_{is1} = \beta_0 + \beta_1 \text{QofK} + y_{is0} + \boldsymbol{x'_i} \cdot \gamma + \theta_s + \epsilon_{is}, \tag{1}$$

where i indexes student at school s, y_{is1} denotes the exam outcome of interest, QofK is an indicator variable equal to one for if the student saw the movie The Queen of Katwe, $\boldsymbol{x'_i}$ is a vector of individual characteristics, θ_s is a vector of school fixed effects and ϵ_{is} is a random error.

y_{is0} is the aggregate mock exam result from before treatment. This mock exam was taken in August 2016, 2 months before the intervention, in the core exam papers for the UCE exam taken at the end of S4. It can therefore be interpreted as a measure of the student's baseline academic ability before the intervention took place.

This ANCOVA specification will be run for all outcomes detailed in this amendment.

The parameter of interest is β_1, the treatment effects of the *Queen of Katwe* movie.

I include the following control variables in $\boldsymbol{x'_i}$ to improve precision, which were measured at the cinema during registration and confirmed with the schools.

1. whether the student is female

For each outcome, I will test the following statistical hypotheses:

1. The aspirational movie has no effect on the outcome, $\beta_1 = 0$.

2.2 Subgroup Analysis

I will estimate heterogeneous treatment effects by augmenting equation 1 to include the variable and the interaction between treatment and the variable. The additional heterogeneity tests being added to the analysis are:

1. An indicator equal to one if the student was below the median exam performance in their mock exams taken prior to treatment.
2. An indicator equal to one if the student is female