Pre-Analysis Plan
Hope and Aspiration Adaptation: Evidence from Glasgow

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1 Introduction

The analysis plan entails the study design associated with the study titled 'Hope and Aspiration Adaptation: Evidence from Glasgow'. A set of outcome variables discussed later are used to assess the impact of exposure to a set of motivational videos and commercials on a cohort of postgraduate (PGT) students in the University of Glasgow, UK. The randomised controlled trial (RCT) aims to contribute to the evidence base of the growing literature on addressing internal constraints via role-modeling interventions.

Beliefs in oneself and on what is attainable to one, can act as strong mechanisms towards goal-setting, effort investment and maintenance of these goals in the face of obstacles (Bandura, 1997, 2015). Through inspiring hope in individuals about their future selves, it may be possible to raise or sustain their aspirations and make them more hard working.

We study the process of aspiration adaptation and whether hope can function as a

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capability fuelling and sustaining aspirations (Duflo, 2012). Using an online RCT, this project attempts to shed light on the relationship between aspiration adaptation and hope.

2 Research Strategy

2.1 Research Questions

- Does exposure to motivational videos increase hope?
- Does exposure to motivational videos increase student aspirations?
- Does exposure to motivational videos increase student effort?

2.2 Sample

The sample consists of all the incoming PGT students at the College of Social Science (CoSS) in the University of Glasgow. To avoid any outliers we will roll out the baseline survey to everyone in the beginning of the semester. To ensure three homogeneous groups (two treatment and one placebo), we will randomise at individual level. The CoSS administration and faculty was approached in the summer of 2020 to gather consent. The sample of students partaking in the study could be from any part of the world, irrespective of their ethnicity, gender, race, age or any other confounding factor information to which is collected as a part of the online baseline survey questionnaire.

2.3 Statistical Power

The average effect size of 1 point improvement in hope scale measures; and 0.5 standard deviations (sd) increase in student aspirations is used for calculating an estimate of the desirable sample size for a two-sided test at 5 percent level of significance. The

power calculations indicate a required sample of approximately 600 students. However, to overcome the potential threats of attrition and compliance, a slightly higher sample will be studied. We follow a very conservative approach, and assume the unexplained variation to be as high as 3 points on the hope scale and 1.85 sd for these calculations.

2.4 Assignment to treatment

Randomisation will be performed using Microsoft Excel, such that each student who responds to the baseline survey and agrees to partake in the study will be assigned to one of the three treatment arms. The first group will receive a treatment that boosts hope and aspirations; the second group will be treated aiming to only increase the aspiration levels, while the third group acts as a control/placebo (from here on referred to as the placebo group). These are explained in the table below:

Treatment 1 (T1)	**Treatment 2 (T2)**	**Placebo (C)**
Aspiration videos	Aspiration videos	Videos with no priming effect
Hope videos		

2.5 Intervention

There are several empirical studies that find that exposure to role models via multimedia channels can have a significant effect on human behavior and psychology (Chong and La Ferrara, 2009; La Ferrara et al., 2012, and Riley, 2017). We use an intervention strategy, similar to Bhan (2019), in which, individuals are exposed to such role-modelling videos on an individual screen.

As a part of the online RCT, we will monitor attendance on Zoom and incorporate weak safety net checks to ensure that participants pay attention to the videos. We hired a production company named 'Braille Cam' to tailor the available advertisements, in-

terviews and trailers on Youtube into two videos on several role-models. Braille Cam, an India-based production company, specialises in making short format videos across all spheres - independent or commercial projects. The video is approximately less than one hour long and will be delivered within one session. The placebo group watches the video of the same length edited by Braille Cam, in so far that they do not have any priming effects. In this way, we avoid any possible experimenter demand effects.

3 Outcomes of Interest

There will be three outcomes of interest. These will be: (i) hope score on the adult hope scale (AHS) (Snyder, 2002), (ii) an aspiration index created using standard questions on aspirations (Garcia et al., 2019) and on the academic aspiration of students by asking the grade they are aiming for, and (iii) effort.

AHS is an eight-item likert-style scale with an agency and pathways sub-scale. The scale has been tested for internal consistency and external validity. Using multiple questions about the lectures/seminars attended in the online survey, we capture information on effort. We will create a standardized index for effort using these questions. Similarly for aspirations, we use a combination of these self-reported questions that can act as a proxy along with three standardized statements, like 'goal-setting is crucial', 'it is better to have aspirations for yourself than to accept each day as it comes' and 'it is better to dream of a better future than to learn to accept the reality of things' with responses ranging from 'definitely false' to 'definitely true'.

We will also collect information on confounding factors, which will not change as a part of the experiment but will be useful for heterogeneity analysis. This is explained later.

4 Data Collection

We will begin the project by administering a baseline survey questionnaire to measure the initial levels of hope and aspirations, along with other confounding factors like age, gender, ethnicity etc. The respondents to this questionnaire will form the participant group.

At the end of the treatment, we will ask the participants to complete a second questionnaire (endline survey). The endline survey will capture information on hope and aspirations and identify any treatment effects. Participants will be asked to fill in two further rounds of survey questionnaires, in regular intervals, to construct a rich panel dataset enabling us to evaluate the change in aspirations during the semester. It is approximated that each of these surveys would require 4-5 minutes, with the exception of the baseline, which is slightly longer and can take between 6-8 minutes. Each of these surveys will be administered via Qualtrics and shall remain live for 36 hours to give ample time and flexibility to the respondents.

An incentive scheme will be put in place to reimburse students for the time that they will spend partaking in survey rounds and the intervention. It will also act as a safety net to reduce attrition within and between groups. All the questionnaires will be online. Data analysis will be performed in Stata.

5 Empirical Analysis

5.1 Estimation and Testing

We intend to estimate the impact of being assigned to aspiration treatment only, or to aspiration plus hope treatment, on the outcomes of interest. To measure the intent to treat (iTT) effect, we use a difference-in-differences (DiD) approach. The specification

is as follow:

$$Y_{it} = \alpha + \beta_1 D_i + \beta_2 T_t + \beta_3 (D_i T_t) + \varphi X_{it}^{'} + \varepsilon_{it} \quad (1)$$

Where Y_{it} represents the main outcomes of interest: aspiration, hope, and effort for individual i at time t. We examine primarily the effect on student aspiration and hope. D_i is a dummy variable that takes value 0 if that individual is in pure control group, takes value 1 if that individual is in aspiration treatment group (or in hope and aspiration treatment group, in a separate estimation). T_t is a dummy variable that equals 0 and 1 for baseline survey and endline survey. A similar before and after specification applies to the follow up surveys. $X_{it}^{'}$ is the vector of covariates of individual i at time t. ε_{it} is the error term.

To answer our research questions, we have the following hypothesis to test:

H_o : The motivational videos have no effect on aspirations, $\beta_3 = 0$

H_o : The motivational videos have no effect on hope, $\beta_3 = 0$

H_o : Extra hope has no effect on aspirations, $\beta_3 = 0$

H_o : Aspirations do not change over time, $\beta_2 = 0$

First, we expect that β_3 is statistically positively significant when the main outcome is aspiration. Second, examining whether exposure to motivational videos increase hope and effort, we replace the main outcome with hope and effort. Similarly, the size and significance of β_3 will enable us to identify the treatment effects. Third, as we conduct extra hope treatment for individuals in group 1, β_3 also captures the change in aspiration through extra hope treatment, which we track and compare over the time. If aspirations of individuals in group 1 sustain longer periods than those in group 2, we could identify the effect of hope on aspiration. Lastly, we study changes in aspirations for students in the control group over the term that β_2 is expected to capture, and thus we can offer evidence on aspirational adaptation.

To further increase power, we follow McKenzie (2012) and estimate treatment effects via an analysis of covariance (Ancova) estimation in addition to DiD. We estimate the

following specification:

$$Y_{it} = \alpha + \beta_1 Y_{i0} + \beta_2 D_i + \mu_{it} \tag{2}$$

Where Y_{it} is added to control for the variations in the outcome at baseline. β_2 captures the treatment effect in the outcome. μ is the error term. As in Riley (2017), we also look for overall treatment effects.

5.2 Heterogeneous Effects

Heterogeneous effects can be expected across numerous confounding factors gender, ethnicity and the strata of low or high hope students, to name a few. Based on the baseline data, differential and marginal treatment effects will be calculated. Moreover, differential effects may pertain to the course that the student is enrolled in. We can estimate this using the baseline information. The differential sustainability of treatment effects based on baseline hope levels is another avenue for heterogeneity testing. Well-defined variables and indicators capture the relevant information on these aspects in the baseline survey questionnaire. Furthermore, it will be possible to explore other effects once the data collection is completed.

5.3 Robustness Checks

- Clustering is avoided by design, as the treatment is offered one-off at individual level.
- Baseline associations will be calculated and later controlled for in the DiD estimation.
- Equation 1 and 2 will be estimated without controls X_{it}.
- In addition to the DiD estimates, we will also perform Ancova.

5.4 Organisation and Deliverables

The online RCT is conducted by the authors under the supervision of Prof. Sayantan Ghosal and Dr. Michele Battisti at the University of Glasgow. The College of Social Sciences (CoSS) and Behaviour, Structure and Interventions (BSI) network at the University of Glasgow fund this study.

We develop a theoretical framework to predict the process of aspiration formation and development, and offer insight into the role of hope in such process. This project's impact lies in the possible design of public policies aimed at increasing students hope and aspirations, which in turn will lead to increased effort levels and, possibly, higher academic achievements (Dalton et al., 2016). The findings will contribute to the new and growing literature on aspirations, and help further the understanding of the role of hope in economic development.

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