IMPROVING ADOLESCENTS' ECONOMIC WELL-BEING THROUGH ECONOMIC AND PSYCHOLOGICAL EMPOWERMENT IN LOW- AND MIDDLE-INCOME COUNTRIES

ANALYSIS PLAN

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RCT summary description

Trial Title: Improving Adolescents' Economic Well-Being through Economic and Psychological Empowerment in Low and Middle-Income Countries

Countries: Colombia, Nepal, South Africa

Status: Ongoing

Keywords: Education, Beliefs, aspirations, cash transfers, Labor Outlook, Poverty-Reduction, Adolescents

Abstract: We study an intervention that integrates self-regulation training with poverty reduction strategies for low-income adolescents and their caregivers in urban Colombia (Bogota), Nepal (Kathmandu), and South Africa (Cape Town). The study is a pilot clustered randomized control trial with 4 arms: self-regulation, economic, a combined arm incorporating both self-regulation and economic interventions, and a control group. This work forms part of the broader research project "Improving Adolescent Mental Health by Tackling the Impact of Poverty – ALIVE", whose general goal is to generate evidence on the mechanisms linking poverty, self-regulation, and mental health among adolescents in economically deprived communities across Latin America, sub-Saharan Africa, and South Asia. In this work, we aim to study the implications of the various treatment arms on economic outcomes of adolescents.

Trial Start Date: March 2024 | **Trial End Date:** November 2025

Intervention Start Date: May 2024 | **Intervention End Date:** November 2024

Outcomes (End Points):
- Education beliefs
- Financial skills
- Negotiation skills
- Consumption
- School adverse events
- School attendance

Experimental Design: 4-arm cluster Randomized Controlled Trial

Was the treatment clustered? Yes, at the school

Planned Number of Clusters: 24 schools

Planned Number of Observations: 628 adolescents

Was IRB approval obtained? Yes, as follows:
- King's College London's Health Faculty Research Ethics Subcommittee (reference HR/DP-23/24-40543)
- The Faculty of Health Sciences' Human Research Ethics Committee at the University of Cape Town (South Africa) (reference number HREC315/2022)
- Innovations for Poverty Action's Institutional Review Board (Colombia) (reference number 4062)
- Ethical Review Board of the Nepal Health Research Council (Nepal) (reference number 1938, protocol reg. no. 167_2024).

1.   Introduction

We study a clustered randomized control trial that integrates self-regulation training with poverty reduction strategies for low-income adolescents and their caregivers in urban Colombia (Bogota), Nepal (Kathmandu), and South Africa (Cape Town). The trial has four arms: a self-regulation arm, an economic arm, a combined arm incorporating both self-regulation and economic components, and a control arm. This analysis forms part of the broader research project "Improving Adolescent Mental Health by Tackling the Impact of Poverty (ALIVE)"[1] whose general goal is to generate evidence on the mechanisms linking poverty, self-regulation, and mental health among adolescents in economically deprived communities across Latin America, sub-Saharan Africa, and South Asia (Lund et al., 2023). ALIVE seeks to evaluate the feasibility of interventions that combine poverty reduction strategies with self-regulation strengthening to prevent depression and anxiety among adolescents living in urban poverty. This is important as existing evidence indicates that combined psychological and poverty-reduction approaches are more consistently associated with improvements in both mental health and socioeconomic outcomes than interventions that rely on either component alone (Tanski et al., 2025).

This analysis plan pertains to studying the key economic outcomes of this trial. Specifically, we examine changes in: (i) adolescent educational outcomes and high-school continuation; (ii) aspirations, beliefs and expected returns related to human capital investment; and (ii) financial behaviors, decision-making and consumption.

2.   Setting and Sample

Our study focuses on adolescents aged 13-15 years, each paired with one of their primary caregivers, living in low-income urban communities and areas in Bogota, Colombia [Col] and Cape Town, South Africa [SA], and in poor households in Kathmandu, Nepal [Ne].

2.1   Inclusion and exclusion criteria

Participants are required to meet specific criteria to be included in our study, which are assessed through the cross-sectional survey during the enrollment phase. Adolescents must be between 13-15 years old, members of households with prominent levels of multi-dimensional poverty, fluent in the local language of each selected site, have screening values for PHQ-A and GAD-7 below the validated country-specific cut-offs, and whose primary caregivers were enrolled in the study for the Colombia and South Africa cases. Participants who do not meet the above criteria were excluded due to high suicide risk and challenges with legal consent of guardians. Regarding caregivers, they must be fluent in the local language, aged 18 years or older, and parents or fosters of adolescents enrolled in the study. Compared to Colombia and South Africa, the enrolment of caregivers was not

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[1] For more details, see ISRCTN14601588 https://www.isrctn.com/ISRCTN14601588

an inclusion criterion for adolescents' participation in Nepal. Participants were free to withdraw from the intervention and/or study at any time without consequence.

We also excluded adolescents based on the following criteria: first, adolescents self-reporting high suicide risk (i.e., suicidal ideation over the past month, suicidal attempts in the past 3 months in Nepal or South Africa, or any suicide attempts in the past month in Colombia); second, adolescents or caregivers with significant disabilities, which cannot be overcome through reasonable adjustments, and which prevent participation in the intervention or completion of assessments; third, unaccompanied minors and adolescents who are married due to challenges with legal consent of guardians.

3. Interventions and Experimental design

3.1 Interventions

We study three interventions: a self-regulation intervention, an economic intervention and a combined intervention.

The self-regulation intervention (T1) aims to strengthen the capacity of adolescents to set goals and to maintain goal-directed behavior, despite emotionally challenging environments characterized by poverty.

The economic intervention (T2) seeks to contribute to reducing poverty by easing income constraints and expense pressures, while strengthening their financial capabilities to support investments in human capital and economic well-being. This included a multi-dimensional program to provide (i) a cash transfer (given 70:30 to the parents: adolescent) to address household income constraints as well as (ii) a series of modules for both adolescents and caregivers to provide information on the benefits of education, financial literacy, and negotiation skills.

The combined intervention (T3) integrates both self-regulation and economic interventions to assess whether the combination exceeds gains from each arm alone. A final group of adolescents and their corresponding caregivers receive none of these interventions in the control arm.

All the interventions consisted of delivering in-person sessions, 20 for adolescents and 6 for caregivers, on a weekly basis over the course of four to six months between May and November 2024. Attendance for both groups was monitored using TeamPact, an offline-capable mobile application. The app enabled facilitators to record attendance, track session duration, and provide feedback on each session.

3.2 Experimental design

The study uses a cluster-randomized design using a 1:1:1:1 allocation ratio, where each cluster corresponds to a school. School-level randomization was chosen to facilitate program delivery and

minimize contamination across participants, i.e. adolescents and their caregivers. A total of 24 clusters (six per country site) were randomly assigned to the four arms, three of which comprise the treatment groups and the fourth is the control group as follows:

1) T1 in which participants were assigned to the self-regulation arm– 6 clusters
2) T2 in which participants were assigned to the economic arm– 6 clusters
3) T3 in which participants were assigned to the combined arm – 6 clusters
4) C in which participants were assigned none – 6 clusters

4.   Data and Timelines

The recruitment of adolescents within clusters (schools) took place in two phases. In phase 1, approximately n=500 adolescents and their caregivers per country site were enrolled from the eight schools in each country, after selecting classes (per grade) representing the study age range of 13-15 years. Phase 2 involved randomly selecting 25-30 participants per school who were not at-risk of depression (< 14, <15, <16 on PHQ-A in Colombia, Nepal and South Africa, respectively) or anxiety (<12 on GAD-7 for Colombia and South Africa, and <10 for Nepal) among those who were enrolled in the phase 1 survey.

We surveyed participants at the baseline (pre-intervention) and conducted two follow-up assessments, 6 months post-baseline i.e. just after the intervention (FU1), and 12 months post-baseline (FU2). Enrolment into the study began in March 2024 in South Africa and concluded in May 2024 for adolescents in Colombia. Baseline assessments with caregivers continued through June of the same year. We also collected information on adolescents' mental health and adolescents' main caregivers using validated psychometric scales to measure the incidence of depression and anxiety among adolescents using the PHQ-A and GAD-7 instruments, as well as socioeconomic and demographic characteristics for both adolescents and caregivers. Our baseline sample consists of a total of 628 adolescents distributed among the three sites as follows: 160 in Colombia, 229 in Nepal, and 239 in South Africa. The interventions were delivered from May 2024 to November 2024 across the three country sites. The first follow-up survey (FU1) took place between September 2024 and November 2024 across the three country sites, while the second follow-up survey (FU2) ran from April 2025 to June 2025. In all surveys, self-reported data was collected face to face using Android tables linked to the ODK platform (https://getodk.org/) with regular checks to ensure accurate data values and data quality.

5.   Empirical Analysis

5.1   Empirical integrity
To establish experimental integrity, we will test for balance on baseline characteristics both at adolescent level and household level between each of the treatment groups and control groups. We will examine mean differences of selected variables across treatment and the control groups.

5.2 Outcomes of interest

We collect data in the baseline and subsequent follow ups for four primary and two downstream economic outcomes for adolescents, for a total of six family of outcomes, as follows: (i) primary: education beliefs and aspirations, financial skills, negotiation skills, consumption, and (ii) downstream: school adverse events and school attendance. For all index outcomes, we standardize the outcomes to have mean zero and standard deviation one. Some family of outcomes include multiple outcome measures as shown in the list below.

We construct three measures for **education beliefs and aspirations:**
- *Beliefs-Labor:* This variable was constructed based on the following question: *"Which of the following do you think is true for adolescents who complete secondary schooling?"* The responses are: 1-They are more likely to end up working in a paid job than those who do not complete it; 2-They are equally likely to end up working in a paid job than those who do not complete it; and 3-They are less likely to end up working in a paid job than those who do not complete it. An indicator variable is constructed to equal one if the respondent selects option 1 and zero otherwise.
- *Beliefs-Earnings:* This variable was constructed based on the following question: "*Which of the following do you think is true for adolescents who complete secondary schooling?*" The responses are: 1-They are likely to earn more in their lifetime than those who do not complete it; 2-They are likely to earn similarly in their lifetime than those who do not complete it; and 3-They are likely to earn less in their lifetime than those who do not complete it. An indicator variable is constructed to equal one if the respondent selects option 1 and zero otherwise.
- *High Edu Aspiration:* This variable was constructed based on the following question: "*How much do you expect to complete?*": The responses are: 1-Elementary school (grade 5) [Col]; 2-Secondary school (grade 9) [Col]; 3-High school (grade 11) [Col]; 4-Technician or technologist (e.g. studying at SENA) [Col]; 5-University degree [Col]; 6-Specialization or master's degree [Col]; 7-SEE or below [Ne]; 8-10+2 [Ne]; 9-Bachelors [Ne]; (x) 10-Masters or above [Ne]; 11-Primary (till grade 7 or equivalent) [SA]; 12-Secondary (e.g. high school/technical or vocational school) [SA]; and 13-University/tertiary (e.g. University/Technikon, College) [SA]. An indicator variable equal to one if the respondent selects option 5 or higher in Colombia, 8 or higher in Nepal, and 12 or higher in South Africa and zero otherwise.

We construct three measures for **financial skills**:
- *Budgeting:* An index constructed by standardizing three indicators related to: (i) having a budget or spending plan; (ii) no difficulty tracking spending; and (iii) no difficulty avoiding wasteful spending
- *Spending control:* An index constructed by standardizing three indicators related to (i) being able to avoid spending money; (ii) having saved money each month for past months; and (iii) having control over whether or no can spend/save money

- *Saving control:* An index constructed by standardizing three indicators related to (i) no difficulty saving money over the past two months; (ii) being able to buy things needed after saving; and (iii) no need to borrow after saving

We construct two measures for **negotiation skills**, both winsorized at the 99th percentile:
- *Schoolwork:* Average hours spent per day by participants on schoolwork and studying at home in the last week
- *Chores:* Average hours spent per day by participants on household chores in the last week
- *Schoolwork vs Chores:* A ratio of hours spent per day on schoolwork versus hours spent per day on chores

We construct measures for **consumption:**
- *Personal consumption*: An index constructed by standardizing measures of consumption related to clothing, shoes, beauty, and jewelry
- *School*-related items: An index constructed by standardizing measures of consumption related to books and school supplies

We construct three measures for **school adverse events** in the past 6 months:
- *Failed*: An indicator variable equal to one if participant has failed a full academic year and zero otherwise
- *Dropped out*: An indicator variable equal to one if participant has dropped out of school for any reason and zero otherwise
- *Kicked out:* An indicator equal to one if participant have been kicked out of school and zero otherwise
- *Adverse events:* An index constructed by standardizing three previous measures

We construct three measures for **school attendance** in the past 4 weeks:
- *Skip classes*: An indicator equal to one if participant has skipped some classes and zero otherwise
- *Skip day*: An indicator equal to one if participant has skipped a whole day of school and zero otherwise
- *Late school:* An indicator equal to one if participant has arrived late for school and zero otherwise
- *School attendance:* An index constructed by standardizing three previous measures and zero otherwise

5.3 Estimation

We will conduct a pooled outcome analysis across the three countries, using the following ANCOVA specification:

$$Y_{isc} = \alpha + \beta^1 T_{sc}^1 + \beta^2 T_{sc}^2 + \beta^3 T_{sc}^3 + \varphi Y_{isc}^0 + \delta' \mathbf{X}_{isc} + \gamma_c + \varepsilon_{isc} \tag{1}$$

For all specifications we will (i) report robust standard errors; (ii) do wild cluster bootstrap to account for the small number of clusters; and (iii) do randomization inference as a robustness check. Coefficients of interest are β_1, β_2, and β_3 which estimate the treatment effects for self-regulation, economic and combined arms respectively, compared to the control group.

Y_{isc} is the outcome of interest for individual i in school s and country c at FU1 and FU2. For Y_i, we listed our outcomes variables in the previous session.

T_{sc} is a dummy variable indicating whether school s in country c is assigned to either treatment T1: self-regulation, T2: economic, or T3: combined arm

Y_{isc}^0 when available, is the baseline level for corresponding outcome of individual i in school s and country c

$\mathbf{X}_{isc}$ are a set of baseline characteristics for individual i in school s and country c (listed below), including their corresponding caregiver characteristics where available

γ_c is a control for each site Bogota, Kathmandu, and Cape Town to account for country fixed effects

The controls variables included, among others, in the vector $\mathbf{X}_{isc}$ are as follows:

Adolescent characteristics at baseline (using baseline adolescent survey data) would include:
- Age
- Sex

Household characteristics at the baseline (using baseline caregiver survey data) would include:
- Household migration status
- Household size
- Highest education of primary caregiver
- Household assets index (car, motorcycle, or mopeds)

We will conduct the analysis at the adolescent level and we will control for household characteristics where possible.

6. Hypothesis

For each outcome listed in section 3.2, we will test following statistical hypotheses:

- Participants assigned to the self-regulation arm will improve outcomes of interest related to the control group, this is $\beta^1 > 0$
- Participants assigned to the economic arm will improve outcomes of interest related to the control group, this is $\beta^2 > 0$
- Participants assigned to the combined arm will improve outcomes of interest related to the control group, this is $\beta^3 > 0$

7. Adjustments for missing data in follow-up surveys

If any outcome is missing for more than 10% of the sample, we will compare the fraction of missing data by assigned treatment status. We do this by estimating model (1) using an indicator for missing as an outcome (omitting Y_{isc}^0) and testing if any of the following linear combinations of parameters are equal zero $\beta^1, \beta^2, \beta^3$.

8. Attrition

The main results will be presented without adjustment for missing (i.e. participants not surveyed in the follow-up rounds). If we observed outcomes where responses are missing for more than 4% of the sample, we will construct bounds on parameters $\beta^1, \beta^2, \beta^3$ using the trimming procedure described in (Lee, 2009).

References

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