Milestone 13

Learning the Value of Education in the Dominican Republic

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Learning the Value of Education
in the Dominican Republic
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The Abdul Latif Jameel Poverty Action Lab — Latin America & the Caribbean
(J-PAL LAC)*

Contents

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1   Executive Summary

1.1   AVE-RD and main objectives

Learning the Value of Education in the Dominican Republic ("AVE-RD") is a three-year policy pilot that implements and evaluates a scalable information campaign on the value and returns of education in the format of soap-opera videos shown to students ranging from 7th to 12th grade. The project's aim is to decrease school dropout rates in urban and rural areas. In order to successfully accomplish this, AVE-RD has established a partnership with the Ministry of Education through the Counseling and Psychology Department (DOP) as implementer, and with *Instituto Dominicano de Evaluación de la Calidad Educativa* (IDEICE) as a research collaborator within the ministry.

The project has been implemented in almost 1,600 public schools in the Dominican Republic and, given it has been proved to be efficient and cost-effective, will be extended and implemented throughout the whole country in an increasing basis, from 2017 to 2020. Also, a diagnostic work has begun in Peru and Chile, which aims to explore the potential for replicating the project in other countries that have different development levels.

The main objective of this policy pilot was to develop a scalable and cost-effective method to deliver information about the benefits of education to students in the Dominican Republic, in order to prevent them from dropping out of school.

1.2   Key results and lessons

Preliminary results (see subsection 5.2) suggest that videos had a negative effect on school dropout (i.e. they reduce the average probability of dropping out of school). The magnitude of this effect is found to be around 2.5 to 3 percentage points reduction (see section 4). We only find significant treatment effects after a one year lag, that is, in students who have already seen a video in the previous year. Further discussion is provided on subsection 5.3.

Our preliminary results also suggest that the videos had a positive impact on students' standardized test scores. For students who watched the videos on the same year in which the test was taken, we find an average increase of tests results of about .05 standard deviations. For students who have been treated twice with the informative video we found an average increase of .12 standard deviations. These results are statistically significant and consistent throughout almost all test subjects. In subsubsection 5.2.2 we present further details of the effect on standardized test scores.

1.3   Scaling path and next steps

AVE-RD has been scaled in an organized way to ensure that implementations were cost-effective and policy-oriented. The Dominican government increasingly took the lead in program implementations, and J-PAL LAC evaluated their impact rigorously.

The first wave of interventions was carried out in 2015, with the implementation being designed and executed jointly by J-PAL LAC and the government. It affected 7th and 8th grade students in 398 public schools. The second wave of interventions was carried out in 2016. It marked both the first

year of scaling, and last year of impact evaluation. The design and execution of the implementation was mainly executed by the Government. In particular, the Counseling and Psychology Department led this process, using lessons learned in the previous year and the assessment of the research group. In addition to the 398 schools of the first year, 1,196 public schools were added to the sample, with students ranging from 9th to 12th grade.

The Dominican government will continue implementing AVE-RD in the next years, and from 2017 onwards the design, execution and financing of AVE-RD will be entirely responsibility of the Ministry of Education of the Dominican Republic. However, due to a limit in the Government's operational capacity, the maximum number of schools that can receive the implementation material in any given year is currently 2,000. Hence, each year at most 2,000 schools will be added to the pool of treated schools until the approximately 4,000 public schools that teach 7th to 12th grade in Dominican Republic receive the material. This will take 3 years to complete. In 2020 the government intends to update the videos, and the process will start all over again.

2   Background

2.1   Overview of AVE-RD, funding and innovation

The founding inspiration of AVE-RD corresponds a study initialized in 2001 by professor Robert Jensen, carried out in the Dominican Republic. In this study, professor Jensen conducted a randomized experiment with 2,250 eighth grade boys where half of the sample received an intervention which consisted on them attending to individuals meetings where information of the actual returns of education was provided. The main finding of Jensen's intervention was that students significantly underestimated returns to secondary education, and providing them with information about the actual returns led them to complete 0.2 additional years of schooling.

The study of professor Jensen was published in *The Quarterly Journal of Economics* on May 2010 as "The (Perceived) Returns to Education and the Demand for Schooling". With this in mind, in 2011 J-PAL LAC and the Ministry of Education of the Dominican Republic initiated preliminary conversations for the replication at scales of Jensen's study but with the innovation that the information provided might be delivered in a teenager-friendly format, such as videos emulating a soap-opera.

In 2012, *Fundación Inicia* granted J-PAL LAC a seed funding of $100,000 to conduct focus groups and pilot surveys for a prospective replication of Jensen's study. One year later, professors Christopher Neilson, James Berry, Lucas Coffman and Daniel Morales along with the sponsorship from The Ministry of Education through its IDEICE applied to the Development Innovation Ventures (DIV) from the United States Agency for International Development (USAID) funding for $1,092,629.

During the first quarter of 2014, DIV awarded $1,258,979 to J-PAL LAC, which was initially disbursed during the second quarter of 2014. Finally, on early 2016 AVE-RD applied for an extension of their funding and DIV granted an additional $510,000, which allowed the project to operate until June 2017.

2.2   About J-PAL LAC

The Abdul Latif Jameel Poverty Action Lab (J-PAL) is a network of 145 affiliated professors from 49 universities. Its mission is to reduce poverty by ensuring that policy is informed by scientific evidence through research, policy outreach, and training across six regional offices worldwide. In particular, J-PAL Latin America & the Caribbean (LAC) is defined as a not-for-profit research center that works alongside governments and NGOs in Latin America and the Caribbean to identify and promote the most effective programs and policies in the region.

J-PAL, along with its partner organization Innovations for Poverty Action (IPA), has conducted more than 820 randomized evaluations in 78 countries. Specifically in Latin America, J-PAL LAC and the regional offices of IPA have developed 132 randomized control trials in a diverse range of topics, with a slight focus on Education and Finance. In the Dominican Republic, the IPA and J-PAL consortium has delivered a rich research agenda of 10 projects during the last decade, of which AVE-RD is one of them.

3   Program Design and Implementation

3.1   Goals of AVE-RD

Despite being one of the most important decisions in a person's life, many people have to decide whether to go to school or not with limited information. This problem is even more acute for the world's poorest. Such households have very little direct data as the parents and close relatives have low education on average. Though these families likely have a good understanding of the qualitative positive relationship between schooling and wages, they probably have an inaccurate and imprecise quantitative understanding of that relationship.

There is evidence that bridging the information gap can affect investment in schooling. As mentioned above, Jensen (2010) informed eighth grade boys of average wages for 30-40 year old men in the Dominican Republic with a primary, secondary, or university education, as well as the increase from level to level, both in absolute and percentage terms. In the subsequent fall, self-reports of being in ninth grade increased from 55% to 59% as a result of the intervention. Further, four years later, graduation rates rose from 30% in the control to 32% in the information arm.

At primary schools in Madagascar, Nguyen (2008) compares providing statistical information to success stories shared by "role models". She finds the statistics increased standardized test scores by 0.2 standard deviations (SD) and attendance by 3.5 percentage points. Though the role model treatment had small mean effects overall, if the role models had a poor background, test scores were found to increase by 0.2 SD, rising to 0.3 SD for poor students.

The main goal of AVE-RD is testing this hypothesis "at scale": how does reducing the information gap affects investment in human capital when we implement this program nationwide? Furthermore we want to develop a scalable and cost-effective method to deliver information about the benefits of education to students in the Dominican Republic.

On top of that, the program aims to analyze the implementation challenges of delivering the information to a large population, besides spillovers, peer effects and other mechanisms of behavioral

change.

3.2   Implementation

The implementation consisted in presenting information about the benefits of higher education and career decision to students through videos. These videos had a soap opera format, presenting stories of public school students that had to overcome different situations to continue studying. In addition, videos had infographics placed inside the soap opera. There were two versions of these infographics: persuasive and informative. Both infographics presented the same core message, but informative infographics presented quantitative statistics regarding the message, while persuasive infrographics showed qualitative information regarding the same subject. For example, when showing expected salaries, a quantitative infographic would show actual average expected returns for different education levels, while a qualitative infographic would say that higher levels lead to higher returns, without any numeric information.

Schools were divided in two treatment groups: persuasive and informative. Table 1 shows the distribution of schools per type of treatment in each implementation year. In the first year (2015), 7th and 8th grade students of 398 schools participated. In the second year (2016), those same 398 schools participated again, and 1,196 schools were added, making for a total of 1,594 schools. Moreover, in the second year students ranging from 9th to 12th grade were able to participate. All participant schools were public schools.

Table 1: Number of schools by treatment group and implementation year

	2015	2016
Informative (quantitative statistics)	200	787
Persuasive (qualitative information)	198	807
Total	398	1594

School psychologists were in charge of showing the videos. Psychologists received a training where they received the implementation material and an explanation of the protocol they should follow. After displaying the videos in their schools, psychologists filled a form that would be collected by a Ministry of Education district technician. All implementation forms were delivered to the local research group, who was in charge of digitalizing the data.

In the first implementation year (2015), the training of psychologists was the responsibility of the local research group and the government, while the collection of implementation material was done by technicians of Ministry of Education. In the second year (2016), both the training and collection of materials were in charge of the Ministry of Counseling and Psychology Department of the Ministry of Education, with the supervision of the research group and public officials.

3.3   Organizations involved in the implementation

Four organizations were mainly involved on the implementations each year. The IDEICE was one of them. The Institute is part of the Ministry of Education and has served as the local partner of the

research. The IDEICE founded the AVE-RD Advisory Committee for this purpose. This Committee was composed of public officials, donors, and researchers that suggested strategies to reach goals of the research and gave their opinions of preliminary results. Furthermore, IDEICE actively participated and supported each part of design, execution, and monitoring of implementations.

Another involved organization was the National Examinations Department of the Ministry of Education. This Department is in charge of applying different standardized tests, including the PISA test. For AVE-RD, the Department applied the baseline and follow up surveys. In the first year of implementation (2015), National Examinations technicians collected implementation forms filled up by psychologists after showing the videos.

The Counseling and Psychology Department of the Ministry of Education was the most important organization in AVE-RD implementations. In the first year, the department facilitated the use of school psychologists to be AVE-RD implementers. In the second year, the department took control of AVE-RD implementation. Counseling and Psychology technicians designed implementation in a format that is conventionally used within Ministry of Education departments with assessment of researchers, trained and delivered implementation materials to psychologists, monitored their execution, collected the applied implementation materials, and delivered material to local research group. In each activity of implementation researchers assessed and supported the department. The Department will continue implementing AVE-RD in the coming years.

Finally, J-PAL LAC served both as a guide and support of implementers in order to make sure they followed research goals. In addition, the J-PAL LAC administered the funding and hired and trained local researchers. In the first year (2015), J-PAL collaborated in the design and training of psychologists, prepared implementation material, and monitored execution and collection of applied material. In the second year (2016), J-PAL participated in the designed, prepared implementation material, and monitored execution.

3.4   Beneficiaries and strategies to reach them

Direct beneficiaries were students of treated schools. These students had the opportunity to watch the videos that presented information about the monetary and non-monetary benefits of education, how to choose a career, and how to finance higher education studies. Moreover, videos contained examples on how to overcome situations that make it difficult to continue studying. In addition to the videos, students had to do a writing exercise on their life goals, aided by the school psychologists. This helped the students to establish their academic goals and to design a strategy to reach them.

4   Evaluation Design

This project studies the effects of providing information on income and other differences by education level on educational choices of middle and high school students in the Dominican Republic. The project includes two parts. First, a policy pilot intended to test the impacts of a series of videos describing the potential benefits to education, which will implemented in two stages. Secondly, an individual intervention that consists of providing parents and children with information on income differences by education level. Primary outcomes include continuation in school and standardized

test scores in the 8th and 12th grades. Intermediate outcomes include the perceptions of average earnings at each level of education, expectations of future earnings, and educational plans and aspirations.

The potential effectiveness of the program rests on the assumption that there is indeed a lack of information regarding expected incomes for different education levels. For a sub-sample of the household of participant students, we conducted an in-depth survey with questions that aimed to better characterize this information gap, among other issues. We found that students consistently underestimated the benefits of higher education levels (e.g. college degree). For instance, Figure 1 compares the students' expected distribution of income groups for people who have a university degree with the actual distribution in the Dominican Republic. We see that students underestimate the percentage of university graduates who are in the richest quintile by almost 40 percentage points, while overestimating their proportion in the poorest quintiles by almost double the actual proportion.

Figure 1: Expected vs. real income group proportions
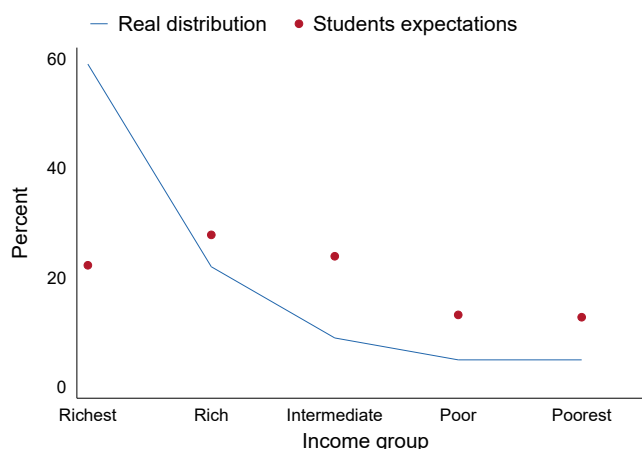
The overall "flatter" perception of income distribution is the salient characteristic of Figure 1, and is also present when doing the same comparison with people in the other end of the education spectrum, that is, for people with incomplete high school (Figure B.2). This provides strong evidence for the existence of the information gap that AVE aims to reduce.

Policy Pilot

The policy pilot consists of two sets of four videos that were shown in two stages. In the spring of 2015, they were shown to 7th and 8th grade students, and in the second stage (spring 2016) we expanded the program to high school students as well. The four videos, each approximately 15 minutes long, tell a story of several characters in 8th grade considering their future educational choices. Each video contains an "infographic" describing in more detail the potential benefits to obtaining

a higher level of education. As mentioned above, across the two sets of videos, the infographics differ by their information content: the *informative* infographics contain detailed statistics on income levels and distributions by level of education, potential non-monetary benefits to education, and scholarships for higher education. The *persuasive* infographics contain qualitative information on income differences by level of education, scholarships, and non-monetary benefits, but do not include detailed statistics.

In addition to the videos, posters were distributed to be displayed in the classrooms. Along the same lines as the infographics, persuasive and informative posters were designed to either emphasize the benefits of schooling qualitatively, or provide average earnings information for different schooling levels. The informative poster was further split into two types: one that contained earnings information for men, and another that contained earnings information for women.

For the first stage, almost six hundred schools were randomly selected from the universe of public upper primary schools in the Dominican Republic. These 599 schools were then randomly assigned to one of three groups:

- T1: Informative video (200 schools)
- T2: Persuasive video (198 schools)
- C: No videos (201 schools)

For the second stage the sample was expanded to:

- T1: Informative video (787 schools)
- T2: Persuasive video (807 schools)
- C: No videos (875 schools).

In both stages randomization was conducted by grouping schools into rural/urban status and region (north, southeast, and southwest). Within each of these 6 groups, one school was randomly selected. Based on the predicted dropout of that school, two additional schools with the closes predicted dropout within the group were selected. Randomization into T1, T2, and C groups was conducted within these triplets.

Individual Treatments

The individual treatments were designed to provide more detailed tests the effects of providing earnings information and distributions at different levels of education. Students and/or parents were randomly selected to be provided with the informative infographic that describes earnings averages and distributions at each level of education. Earnings of either men or women were provided based on the gender of the student. 250 schools were randomly selected to be included in the individual treatments:

- T1: 50 schools
- T2: 50 schools
- C: 50 schools

- Other public schools: 50 schools

- Other private schools: 50 schools

Within each selected school, up to 28 students were selected to be included in the individual treatments. Among these students, the first 12 appearing on the roster were selected to be visited at home to have surveys and/or information provided to parents. These 12 were randomly assigned as follows:

- P1: 4 students (information for parent)

- P2: 4 students (information for student)

- P3: 4 students (surveys only)

For the remaining 16 students, surveys were conducted with the students only. Of these, half were assigned to receive information:

- S1: 8 students (information for student)

- S2: 8 students (surveys only)

4.1   Key indicators, instruments and outcomes

School dropout

The primary outcome variable is school dropout in the 2015-2016 school year. Enrollment is determined through data obtained from the Ministry of Education in the years following the study. Because we are using multiple data sources without unique identifiers across these sources, it is necessary to match students across sources using identifying information of name, date of birth, and gender.

Standardized Test Scores

The key secondary outcome variable is the student's scores on the National Examinations (*Pruebas Nacionales* in Spanish). *Pruebas Nacionales* are a set of standardized tests taken by students at the end of their 8th and 12th grade (in June). All students in the Dominican Republic are required to pass these tests in order to continue with secondary studies in case of 8th graders, or to graduate school in the case of 12th graders. The test consists of four different subjects: Spanish, Math, Social Sciences and Natural Sciences.

Secondary outcomes

Based on the school and individual surveys, we analyze treatment effects on a number of intermediate outcomes. These outcomes include beliefs of average earnings and the distribution of earnings, expected self-earnings and the distribution of self-earnings, educational aspirations and plans and time management, among others.

4.2   Empirical Strategy

In order for the estimation sample to be consistent with the sample used in the written policy pilot surveys, the policy pilot estimation sample consists of all students enrolled in the sample schools during the 2014-2015 school year.

The matching algorithm matches observations based on observable characteristics and proceeds in several iterations, decreasing the amount of observables in each iteration as the pool needed to be matched gets smaller. In every iteration a set of observable variables are defined and all unique matches across databases are accepted as a match and eliminated from the process. In the next iteration, new observables characteristics are defined and matches are once again identified. The key aspect of the algorithm is the list of variables used to match observations and the order in which this is implemented.

The techniques used to define observable characteristics which are then used to matching can be grouped in three sets. The first set of iterations will use exact matches in every variable of the set defined. In later iterations we define a second way to match observations that allows comparisons of string (alphabetical) variables that is robust to "typos." Finally, a third type of match is used when some of the variables are suppressed from the set of variables that forms the groups. We can then, for instance, group two individuals even if in one of the databases him/her second name was not written.

In the enrollment data, every student comes with an identification number. However, there is evidence that this ID number might be sometimes wrong. The data also contains two first names and two last names plus gender and birth characteristics. Again, sometimes that information changes from one year to the other. Names usually have typos, one individual can be found across years with different but similar names and/or with different student IDs. We also think that when schools provide the student enrollment information and don't know their birth date, they might just give their best guess.

School dropout

We analyze the impact on school dropout by estimating the following model:

$$Y_i = \alpha_0 + \beta_1 INF_s^{2016} + \beta_2 PER_s^{2016} + \beta_3 INF_s^{2015} + \beta_4 PER_s^{2015} + \gamma X_{is} + \epsilon_{is},$$

where

- Y_i is a dummy for enrollment in the 2016-2017 school year
- INF_s^{2016} and PER_s^{2016} are dummies indicating assignment to the informative or persuasive treatments the second year of the project (2016)
- INF_s^{2015} and PER_s^{2015} are dummies indicating assignment to the informative or persuasive treatments the first year of the project (2015)
- $X_i s$ is a vector of control variables.

Thus, in the case of students that received informative videos for two consecutive years, the effect size is $\beta_1 + \beta_3$. Analogously, for persuasive videos the effect is $\beta_2 + \beta_4$.

Standardized Test Scores

In order to analyze treatment effects on standardized test scores, we categorize students into three mutually exclusive groups:

- Group 1: students that participated in the first year experiment (2015) that received the videos on 8th grade, three weeks before taking *Pruebas Nacionales*.

- Group 2: students that participated in the second year experiment (2016) that received the videos on 8th grade, three weeks before taking *Pruebas Nacionales* and also received the videos on 7th grade the previous year (2015).

- Group 3: students that participated in the second year experiment (2016) that received the videos on 8th grade, three weeks before taking *Pruebas Nacionales* but did not received videos the previous year (2016).

For groups 1 and 2 received the treatment three weeks before taking the test, on the other hand group 2 watched the video more than a year before and again 3 weeks before the test. If we separate the above groups by treatment types, we have six dummies for the equation. Differently from the equation presented in the enrollment analysis, in the following equation each student belongs only to one category.

$$Y_i = \alpha_0 + \beta_1 INF_s^{2016} + \beta_2 PER_s^{2016} + \beta_3 INF_s^{2015} + \beta_4 PER_s^{2015} +$$
$$\beta_5 INF_s^{2y} + \beta_6 PER_s^{2y} + \gamma X_{is} + \epsilon_{is},$$

where

- Y_i is a the test score of the student i

- INF_s^{2016} and PER_s^{2016} are dummies indicating assignment to the informative or persuasive treatments the second year of the project (2016)

- INF_s^{2015} and PER_s^{2015} are dummies indicating assignment to the informative or persuasive treatments the first year of the project (2015)

- INF_s^{2y} and PER_s^{2y} are dummies indicating assignment to the informative or persuasive treatments both years of the project (2015 and 2016)

- $X_i s$ is a vector of control variables, in this case average test score of previous year, class size and average passing rate.

5   Findings

5.1   Lessons from Implementation

The most important lesson from implementation was the use of call centers in monitoring. Public officials from Ministry of Education recognized that, in general, policies aren't monitored appropriately. The local research group implemented a call center in both implementation cycles, hiring

telephonists that called each psychologist and asked them whether or not had showed videos. Psychologists took advantage of the call and asked questions of the implementation protocol. Moreover, some psychologists stated what logistic issues obstructed them to apply videos. In that case, telephonists contacted the corresponding technician to try to find a way to solve the logistic issue. Hence, psychologists not only received pressure to implement through calls, but also received help during implementation.

Another important lesson was the motivation in trainings. Showing videos in Dominican public schools is a challenge, since only 40% of them have the appropriate equipment to show videos and only 30% of them receive 24 hours of electricity. Therefore, when technicians and psychologists were trained, they received an explanation of how important was their role in AVE-RD for the country and that they should find a way to show videos in schools. Technicians and psychologists felt motivated and found creative ways to show videos, such as visiting the local church that has equipment and electricity.

5.2   Preliminary Results

In this section we have summarized preliminary results on the effect of providing information on income and other benefits by education level on educational choices of students of middle and high schools in the Dominican Republic. Our primary outcome variables are school dropout and standardized test scores in the 8th and 12th grades. Intermediate outcomes include the perceptions of average earnings at each level of education, expectations of future earnings, and educational plans and aspirations.

In order to interpret the results, it is important to consider the gap between the time of the intervention and the time at which the outcome of interest was measured. Table 3 shows each outcome instrument used in this analysis and the date when it was collected, which lets us gauge the amount of time between both of them.

Table 2: Timing of intervention and sample size

Date	Quantity of Schools	Grades
May-2015	599	7th and 8th
Apr-2016	2,469	7th to 12th

Table 3: Timing of primary outcomes

		Time after Intervention	
Date	Outcome	2015	2016
Jun-2015	Pruebas Nacionales 8th grade	1 month	-
Aug-2015	Enrollment school year 2015-2016	3 months	-
Jun-2016	Pruebas Nacionales 8th grade	1 year	1 month
Aug-2016	Enrollment school year 2016-2017	1 year	3 months

5.2.1   Effects on School Dropout

We define school dropout as not being enrolled in school, conditional on that student having been enrolled in the previous year. We consider dropout from year to year using administrative data of school enrollment, which we use to calculate dropout at the student level.

In order to calculate dropout, we take a cohort and follow it into the next year enrollment data. We determine who is enrolled and who is not we use the fuzzy merge algorithm described in subsection 4.2.

First intervention (2014-2015 school period)

The first intervention was carried out on year 2015, and we first observe enrollment for the 2015-2016 school period (the period that immediately follows). This first intervention was comprised of 599 schools, 201 of which are control schools and the remaining ones being treated with the two variations of the videos in even proportions. Table B.1 in appendix B has a more detailed breakdown.

We measure the impact of being in a school in which a treatment video was displayed on the binary outcome of being enrolled in school on the next year. It is important to note that the enrollment decision was carried out 2 to 3 months after watching the videos, as they were shown in the end of the 2014-2015 school period. Table 4 shows the impact of both treatments on school dropout, by grade (Table B.2 shows aggregated results). These results indicate that the first intervention wave had no significant effect on school dropout for the following school period.

Table 4: First-year treatment effect on dropout, by grade

	Probit		OLS	
	(1) 7th grade	(2) 8th grade	(3) 7th grade	(4) 8th grade
Informative video	-0.00735 (0.0147)	0.00386 (0.00979)	-0.00739 (0.0148)	0.00386 (0.00980)
Persuasive video	-0.00641 (0.0157)	0.00154 (0.00981)	-0.00646 (0.0158)	0.00153 (0.00976)
Observations	33873	31879	33873	31879

Standard errors in parentheses, clustered at the school level

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Second intervention (2015-2016 school period)

A second wave of interventions was carried out in the following year, that is, in the end of the 2015-2016 school period. Table 5 shows the pooled effect on dropout rates for the 2016-2017 school period. We see that the biggest effect is for receiving the video the previous year, which indicates a

lagged effect on dropout. This observation is also coherent with the results on enrollment for school year 2015-2016, presented in the above section.

Table 5: Second-year treatment effect on dropout

	(1) Probit	(2) OLS
Informative video	-0.00558 (0.00594)	-0.00570 (0.00600)
Persuasive video	-0.00364 (0.00621)	-0.00378 (0.00632)
Informative video previous year	-0.0303*** (0.00597)	-0.0279*** (0.00525)
Persuasive video previous year	-0.0281*** (0.00641)	-0.0262*** (0.00580)
Grade FE	Yes	Yes
Observations	428400	428400

Standard errors in parentheses, clustered at the school level

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

We disaggregate treatment effects by grade, and results are shown in Figure 2. This figure summarizes the effect on school dropout for both treatments in years 2015 and 2016, by grade.[1] The outcome variable is again dropout rate for school period 2016-2017. This figure is interesting, because it reveals several new insights.

First, the magnitude of the effect seems to increase as we observe students in higher grades, regardless of the type of video or year of the intervention. This seems reasonable, because the cost of finishing high school diminishes as students approach the 12th grade, while expected average returns remain constant (the video is the same for all grades). Having said that, the null hypothesis cannot be rejected for almost all grades that have seen the videos in 2016 (except for 11th graders that saw the informative video).

Second, there is a significant average reduction in dropout rates for students that saw either video on year 2015. Note that the outcome variable is dropout rate for the 2016-2017 period. As stated previously (Table 4), our results show that these videos had no effect on the 2015-2016 school period dropout rate. Given that the 2016 videos also show no significant effect on the 2016-2017 period dropout rates, taking this evidence as a whole seems to suggest that the videos have a lagged effect on students: we never observe any significant effects on enrollment of the period that follows, but we do observe an effect after an additional school year has passed.

Third, we find that there is no clear "best" treatment. If we focus on the lagged, significant effects of the treatments (i.e. 2015 videos in Figure 2), there is no evidence that one type of video has

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[1]In appendix B, Table B.3 shows the same coefficients plotted in Figure 2, and Table B.4 shows the corresponding OLS estimations.

Figure 2: Second-year treatment effect on dropout by grade (probit)
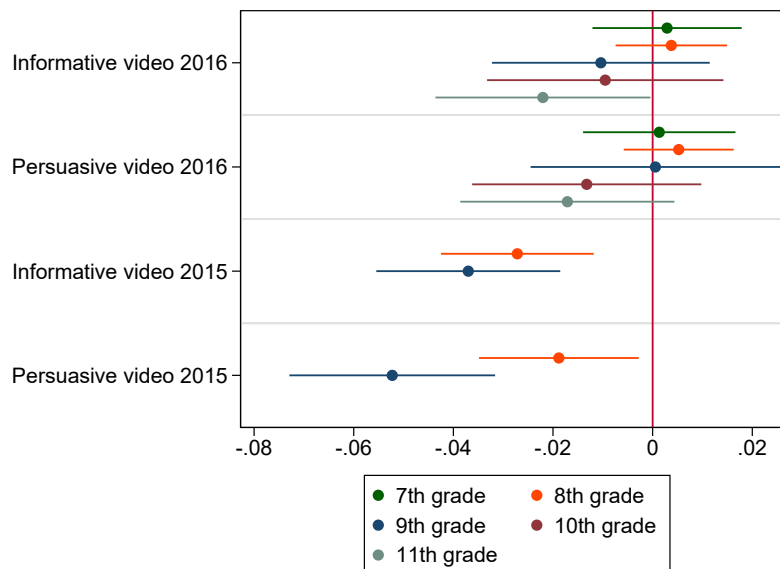
a greater overall reduction on school dropout: although persuasive videos seem to have a greater effect on 9th graders, it conversely shows a smaller effect for 8th graders.

5.2.2   Effects on Standardized Test Scores

We now turn our attention to treatment effects on standardized test scores on 8th grade students. The National Examinations (*Pruebas Nacionales* in Spanish) are a set of standardized tests taken by students at the end of their 8th and 12th grade (in June). All students in the Dominican Republic are required to pass these tests in order to continue with secondary studies in case of 8th graders, or to graduate school in the case of 12th graders. The test consists of four different subjects: Spanish, Math, Social Sciences and Natural Sciences.

We observe students' test scores for the 2016 National Examinations. This means that a given student may have seen either type of video in 2016, and also in 2015. Figure 3 shows the treatment effects of both types of videos. The effect is measured in units of standard deviation. These results indicate that in watching the videos in the same school period when the test was given has a significant positive effect on overall scores, with a slightly larger effect for informative videos. The treatment effect seems to be reinforced if applied twice, as the largest effects are observed for students that watched the informative videos twice.

Table 6 shows the same results disaggregated by test subject. Again, these results suggest that the informative videos overall have a larger impact on tests scores, and the effect is usually larger when the treatment is applied twice (except for the Math test).

Figure 3: Treatment effect on pooled test scores - *Pruebas Nacionales* 2015 and 2016
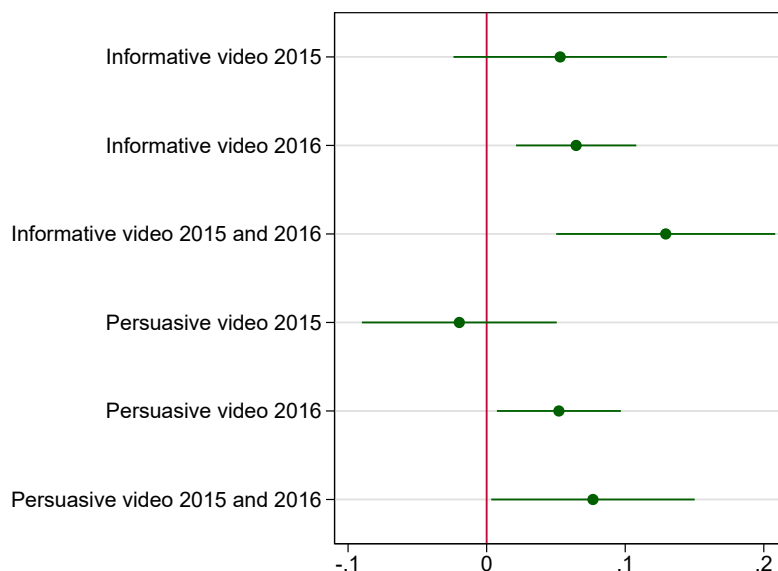
Finally, in order to explore heterogeneous treatment effects we run a quantile regression on students overall scores. This allows us to analyze whether the treatment is concentrated on the high or low-performing students. We ran this regressions only for the students who received the treatment twice, and results are shown in Figure B.3 in appendix B. Results suggest that the both videos have a larger effect on higher deciles of the distribution; the pattern is specially clear for the informative videos.

This result is interesting, because it suggests that the videos are not only affecting students in the verge of dropping out of school —who tend to be low-performing students—, but also students

This result is interesting, because it suggests that the videos not only affect low-performing students —who tend to be the ones more likely to dropout of school—, but also high-performing students. We believe this large effect on the upper side of the distribution is explained by two facts. First, the information gap on the returns of education are large, as discussed in section 4 (see Figure 1 in particular). This large information gap is relatively constant, so high-performing students also underestimate the benefits of higher education. Second, there is also an information gap regarding how difficult it is to pay for higher education: students consistently rank money-related problems as main obstacle in pursuing higher education, and we find that the treatment as a large effect on reducing this misconception. Taking these two facts together, we can hypothesize that students are affected by the treatment because it adjusts both their expected benefits and costs of getting more education, and both adjustments tend to be larger for high-performing students.

Table 6: Treatment effect on test scores by subject - *Pruebas Nacionales* 2015 and 2016

	(1) Overall	(2) Spanish	(3) Math	(4) Soc. Sci	(5) Nat. Sci
Informative video 2015	0.0531 (0.0392)	0.0172 (0.0312)	0.0575 (0.0392)	0.0257 (0.0415)	0.0893* (0.0502)
Informative video 2016	0.0646*** (0.0221)	0.0235 (0.0177)	0.0772*** (0.0221)	0.0558** (0.0242)	0.0584** (0.0235)
Informative video 2015 and 2016	0.129*** (0.0403)	0.118*** (0.0305)	0.0619 (0.0420)	0.110** (0.0436)	0.136*** (0.0454)
Persuasive video 2015	-0.0197 (0.0358)	-0.00180 (0.0292)	-0.0435 (0.0362)	-0.00334 (0.0377)	-0.0242 (0.0454)
Persuasive video 2016	0.0521** (0.0228)	0.0170 (0.0183)	0.0510** (0.0221)	0.0425* (0.0248)	0.0656*** (0.0250)
Persuasive video 2015 and 2016	0.0767** (0.0374)	0.0816*** (0.0279)	0.0137 (0.0402)	0.0971** (0.0437)	0.0625 (0.0435)
Grade FE	Yes	Yes	Yes	Yes	Yes
Baseline Scores FE	Yes	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes	Yes
Observations	120092	120092	120092	120092	120092
R^2	0.221	0.126	0.202	0.202	0.183

Standard errors in parentheses, clustered at the school level

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.3   Generalization and external validity

The AVE-RD treatment works under the assumption that there exists a significantly large difference between students' beliefs and actual returns to education. If that is the case, the program's fulfills the role of reducing information gap of "consumers" (students, and their parents to some extent), thus allowing them to make better decisions. In order to be able to replicate these results successfully in other scenarios, it must be explored carefully whether the education market presents such information gap on the demand-side. As stated in the previous subsection, information gaps not need to be only about the benefits of education; it could also relate to the costs.

When students underestimate the benefits of education, or when they overestimate its costs —or any combination of both— there is potential for an information program to improve both students' performance and school attendance. Special attention should be payed to the direction of this misinformation: if students actually underestimated education costs or overestimated its benefits, a program like AVE could produce other, unexpected results. The answer to whether a program under such scenario would be beneficial or not is not as clear cut as in our case.

6 Cost-effectiveness and competitive landscape

6.1 Competitive advantage of Information in Education policies

Most policies aimed to tackle underinvestment in human capital focus on the supply-side of education. By contrast, frictions in the demand-side —which may explain low educational achievements in the Latin America and the Caribbean— have received less attention from policy-makers, despite having caught the attention of scholars who have been trying to understand individual decisions in education for years.

Policies on the supply side, such as school construction or teachers training are important and may have great impact but they are often considerably expensive. For instance, supply-side interventions such as remedial education and computer-assisted learning in India showed cost-effectiveness rates of 3.05 and 1.54 SD increase in standardized tests per $100 and constitute the most efficient interventions. On years of human capital investment, the Jensen's study on 2001 yielded 1.47 additional schooling years per $100 while other interventions such as free primary school uniforms or merit scholarships yielded less than a year of additional schooling.

It might be misleading to compare learning-focused strategies such as computer assisted learning with additional-schooling policies, however, it's highly likely that the impact of both family of interventions have spillover effects on other relevant outcomes.

It must be pointed another approach apart from demand or supply-side strategies. The most widespread policy for reducing dropout rates in the region is the "compulsory completion of secondary education". This policy has been applied in Argentina, Peru, Venezuela, Chile, Ecuador, Bolivia and the Dominican Republic with mixed results and there is no evidence that links dropout rates with the introduction of this legal mechanism (for example, Bonal 2004).

6.2 Cost-effectiveness analysis

In terms of cost-effectiveness, AVE-RD has proved to be efficient in terms of increasing the performance of students in standardized tests and additional schooling years. To assess these indicators it is necessary to first understand the structure of costs of the implementation of AVE-RD. Indeed, the major investment was executed in the production and elaboration of the videos ($104,000) and further improvements for the implementation of the second year ($25,400). The second highest costs was the training of technicians to effectively deliver the videos to the schools they were in charge. The training expenses, which included transportation, food and personnel ranged from $22,000 to $63,000 from years 2015 to 2016. Other costs such as monitoring, CDs and materials were no higher than $13,000.

The structure of costs indicates that the most relevant fixed cost is the elaboration of videos and any other cost is variable to the numbers of schools intended to reach, so it can be expected that the cost-effectiveness may be higher when more schools are reached.

With this in mind, we determined a cost-effectiveness analysis in both performance in standardized tests and additional schooling years as the most important outcomes from the side of policymakers. As outcome of the increase in scores on standardized tests we used the Overall Score from National

Examinations of 8th grade on 2015 and 2016 and weighted the variable costs of implementation to target those students who watched both informative and persuasive videos (see section Findings, table X and Y). Unfortunately, for assessing the additional schooling years, the treated cohorts must finish the last year of high school, which is expected to happen by 2019. Table 7 summarizes cost-effectiveness on performance on standardized tests.

Table 7: Cost-effectiveness on performance on standardized tests. "Inf." stands for Informative Videos; "Pers." stands for Persuasive Videos.

| | Watched the videos once | | | | Watched the videos twice | |
| | 8th grade (2015) | | 8th grade (2016) | | 7th and 8th grade | |
	Inf.	Pers.	Inf.	Pers.	Inf.	Pers.
Significance	*None*	*None*	*At 0.01*	*At 0.01*	*At 0.01*	*At 0.05*
SD increased per \$1	0.01	0	0.02	0.01	0.01	0.01
SD increased per \$100	0.75	-0.03	1.66	1.35	1.27	0.80
Cost of increasing in 1 SD	133.1	-3308.3	60.2	73.9	78.5	124.4

Despite these cost-effectiveness rates represent promising figures, they account only for the policy pilot implementation. Indeed, if this program is scaled-up, as it has been announced from the Ministry of Education, its cost-effectiveness might be even higher. For testing this hypothesis, we ran a simulation using average variable unitary costs from implementations 2015 and 2016 and full costs of videos production. Figure 4 shows how the ratio of cost-effectiveness as the cost of increasing in 1 SD in National Examinations decrease dramatically while increasing the number of public schools (which offer 7th and 8th grades) included in the policy. As expected, watching the videos for two years yields the highest cost-effectiveness.

Figure 4: Simulated Cost-effectiveness as the cost of increasing in 1 SD in the 8th grade National Examinations in different scenarios of schools reached. "Inf." stands for Informative Videos; "Pers." stands for Persuasive Videos.
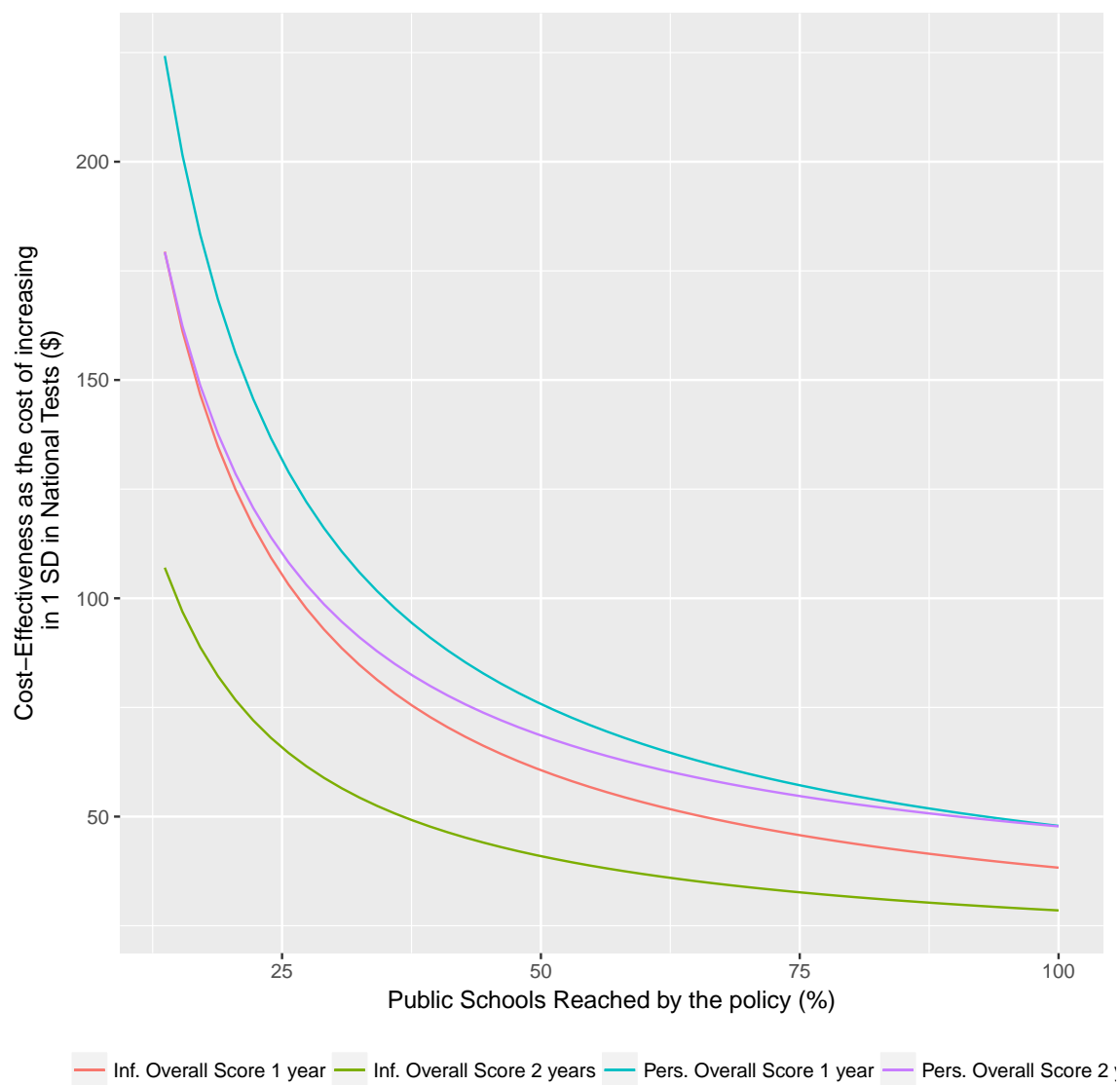
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SD in National Examinations decrease dramatically while increasing the number of public schools (which offer 7th and 8th grades) included in the policy. As expected, watching the videos for two years yields the highest cost-effectiveness.

7   Scaling plan

7.1   How AVE-RD was scaled

AVE-RD has been scaled in an organized way to ensure that implementations were cost-effective and policy-oriented, Government increasingly took the lead in implementations, and researchers evaluated the impact rigorously. In the first year (2015), the implementation was designed and executed by J-PAL LAC and Government, participating 7th and 8th grade students of a total of 398 public schools.

The second year (2016) represented the first year of scaling and last year of impact evaluation. The design and execution of implementation was mainly responsibility of the Government, especially, the Counseling and Psychology Department of the Ministry of Education, using lessons learned in the first year and the assessment of the research group. In addition of the 398 schools of the first year, 1,196 public schools were added and 9th to 12th grade students also participated.

7.2   Implementation plan for coming years

The Counseling and Psychology Department of the Ministry of Education will be the department in charge of AVE-RD implementation. The department will finance and provide their technicians and psychologists to lead and monitor implementations. The present year (2017), the department has provided 1,730,000 Dominican pesos ($36,808) for this year implementation.

Informative videos (videos with quantitative statistics) had the highest outcomes according to preliminary results. Hence, in the foregoing, all schools will receive only informative videos. In addition, psychologists will use a website to download implementation material, upload evidences of the application of videos (i.e. photos), and answer a survey of the experience. In the same way, technicians will be able to observe which psychologists of their districts or regionals have uploaded photos and completed forms, as a way of monitoring.

Due to a limitation in resources and logistical management, the number of schools that is possible to delivery implementation material is 2,000 school per year. Once the material is in the schools, the school psychologist can continue to show videos and lead the writing of the project of life the coming years. In 2015 and 2016, applied implementation material was collected, which means that CDs with videos aren't currently on schools. Hence, in 2017, the 1,594 schools of 2016 will receive implementation material again and 406 schools will be added, adding up 2,000 schools (maximum quantity of schools per year). These schools will receive implementation material via the website.

In 2018, the 406 schools that was added in 2016 and 1,594 new schools (i. e. never implemented) will receive physical implementation material, since Counseling and Psychology Department of the Ministry of Education will assigned economics resources to AVE-RD implementation. The 1,594

Table 8: 2017-2020 Implementation Plan

Year	Activity	New schools	Schools receiving implementation material	Implemented schools
2017	Delivering of implementation material via website	406	2,000	2,000
2018	Delivering of implementation material via website and physical, and reminding implementation to schools that have material	1,594	2,000	4,000
2019	Delivering of implementation material via website and physical, and reminding implementation to schools that have material	All public schools	All public schools	All public schools
2020	Updating infographics			

schools of 2016 will receive a reminder by technicians to implement AVE-RD. Therefore, in 2018, a total of 3,594 schools will apply videos. In 2019, all public schools that haven't participated in AVE-RD will receive physical implementation material. Table 8 summarizes 2017-2020 implementation plan. In 2020, videos infographics will be updated by the Counseling and Psychology Department.

7.3 Role of research influencing stakeholders

8 Miscellaneous

8.1 Collaboration with USAID/Dominican Republic Mission

AVE-RD has closely collaborated with the project Alerta Joven, funded by the local USAID Mission. This promising program aims to create a sustainable and multidisciplinary security network for young people in vulnerable situations of crime and violence. The initiative works to reduce crime and violence through integrated activities providing education, job opportunities and health training to young people at risk by marginalization and deprivation of rights. However, the main limitation to scaling-up the program is the cost of identifying and locating at risk students before they dropout.

The AVE-RD team approached Alerta Joven with the idea of applying Machine Learning techniques to predict those students at highest risk of dropping out. This idea was developed at the 2016 Microsoft Hackathon and then further developed by the AVE-RD team.

Using only administrative data, we trained and tested four Machine Learning models:

- Logistic Regression
- Neural Network
- Ridge Classifier
- Random Forest

Table 9 presents the overall goodness of fit by model. We also tried an ensemble of the four models, whose results are not reported here. The best fit was achieved by Neural Network, with an overall fit of 69%, although all models perform similarly.

Table 9: Goodness of fit by model

Model	Fit
Logistic Regression	0.6618
Neural Network	**0.6905**
Ridge Classifier	0.6771
Random Forest	0.6817
Ensemble	0.6855

In this case, for *Alerta Joven* the relevant result is to identify the most at risk students. This would require us to look into more detail into each model's predictions.

If we rank the students by their predicted risk factor, we can get the goodness of fit according to the number of students we want to treat with the program. For example, if we want to select 2,000 students to give the program to, we would rank the students by risk and choose the top 2,000. Table 10 shows the goodness of fit of the models for the 2,000 more at risk students.

Table 10: Goodness of fit for the 2,000 most risky students, by model

Model	Fit
Logistic Regression	0.828
Neural Network	0.869
Ridge Classifier	0.889
Random Forest	**0.895**

Moreover, *Alerta Joven* and J-PAL LAC have initiated conversations for conducting an experimental version of the *Alerta Joven* intervention expected to begin by 2018. The goal is to evaluate how the interventions of *Alerta Joven* affect its subjects and, at the same time, continue to improve our predictive models to find the most at risk students, increasing the scope of the project.

8.2   Next steps and submission of generated datasets

One of the main research goals of AVE-RD is to expand the body of evidence that exists in the economic literature regarding demand-side strategies to boost investment in human capital. In this sense, the planned activities to achieve the academic publication of the findings of AVE encompasses the following steps:

- Further data analysis and database cleaning.
- Expansion of the In-Depth survey with data from a Conditional Cash Transfer program (Prosoli) from the Dominican Government.

- Wait until initially treated cohorts take a new round of National Tests and POMA tests (admission exam for higher education).

Moreover, AVE-RD has created valuable datasets that describe the beliefs and dynamics on how students and parents perceive the returns of education in the Dominican Republic. These datasets are expected to be delivered to IDEICE and submitted along with the academic publication (estimated as the fourth quarter of 2017 for the first draft of working paper). The datasets generated by AVE-RD and which will be delivered to IDEICE are:

- The 3 student's belief surveys: baseline (2014), follow-up (2015) and endline (2016).
- The 3 batches of In-depth surveys: 2015, 2016 and 2016/2017.
- The labor supply module extension.

References

Bonal, Xavier (2004). "Is the World Bank Education Policy Adequate for Fighting Poverty? Some Evidence from Latin America". en. In: *International Journal of Educational Development* 24.6, pp. 649–666.

Jensen, Robert (2010). "The (Perceived) Returns to Education and the Demand for Schooling". en. In: *The Quarterly Journal of Economics* 125.2, pp. 515–548.

Nguyen, Trang (2008). *Information, Role Models and Perceived Returns to Education: Experimental Evidence from Madagascar," mimeo.*

Olken, Benjamin A. (2015). "Promises and Perils of Pre-analysis Plans". In: *Journal of Economic Perspectives* 29.3, pp. 61–80.

Appendices

A   In-Depth Survey Analysis

The in-depth survey is a crucial source for assessing the impact of the program without our target population. This survey can track how treated students may differently use their time and how treated households allocate their resources across their members, putting some to work while investing in the human capital accumulation of others. The final phase of the In-Depth survey ended in April 14 of 2017 with a total of 3,625 students and 821 parents.

A.1   In-Depth students

This survey collects a big amount of data about students' perception of education returns. The following graphs shows some of the information that we can extract from this data collection process. These plots will be classified as follow: dropout, labor, performance self-perception, salary expectation and time use.

Figure A.1: Attends to school by gender

N Male: 2017
N Female: 1608
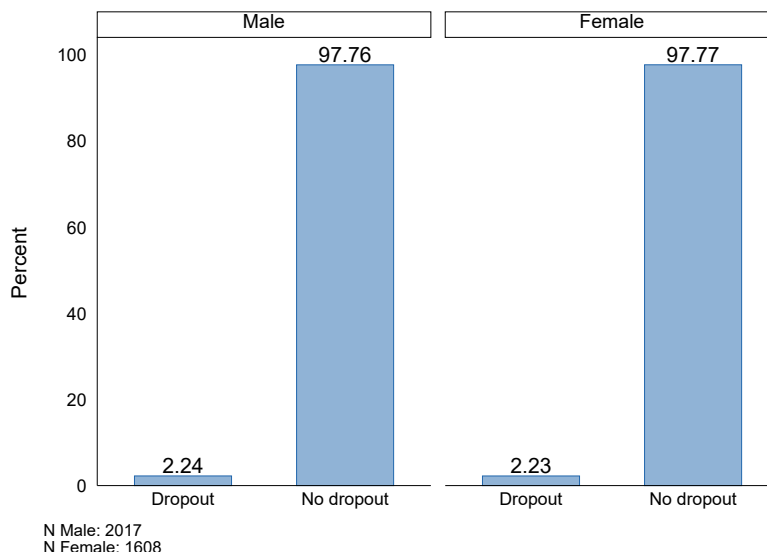
A.2   Dropout

The whole process of the In-Depth survey had a special focus to find the students that left school according to admin data and try to get important information about the reasons and the circumstances of that decision. The total amount of dropout child found were 81 (2.23% of the total students surveyed).Figure A.1 shows this dropout rate by gender.

We can see that the dropout rate for male and female is almost the same, but for boys is slightly bigger but it does not seem relevant. On the other hand, an important information the we can see is how accurate the admin data is to measure the dropout rate in Dominican Republic.Figure A.2 shows the dropout rate found in the In-Depth survey given if the admin data tell is dropout or not. Figure A.2 shows that, in the group of students that dropped out according to admin data, just an 8.88% is a truly dropout and the 91.12% left are still in school. on the other side, some of the students that admin data says that are attending school 1.55% has dropped out of school. This calls into question the credibility of the administrative data regarding the measurement of dropout rates. At the same time it is interesting to see the reasons why students leave school.Figure A.3 shows this information. It is impactful to observe that pregnancy is the main reason why students leave school, according to the responses in the survey. These is shocking because pregnancy is a situation that stays for a longer time and more difficult to overcome for a student. The other reasons that follow are that students prefer to work and make money, distance from school and health issues. However, these circumstancesn are not a only affecting the student but the family, so it is relevant to know who makes the decision to leave the school. Figure A.4 illustrate that. We can see that the most students take the decision by them self and the parents don't intervene in the process. Maybe parents are not concerned about the future returns of education and that's why they let the

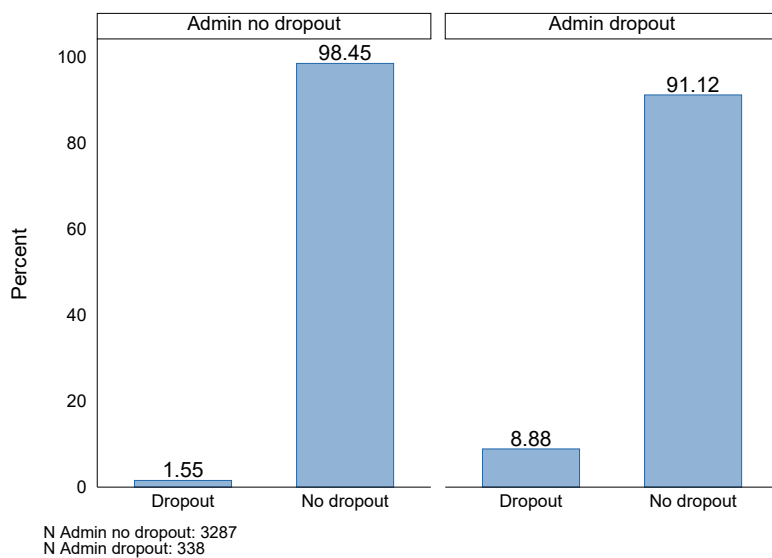Figure A.2: Attends to school by admin dropout

N Admin no dropout: 3287
N Admin dropout: 338
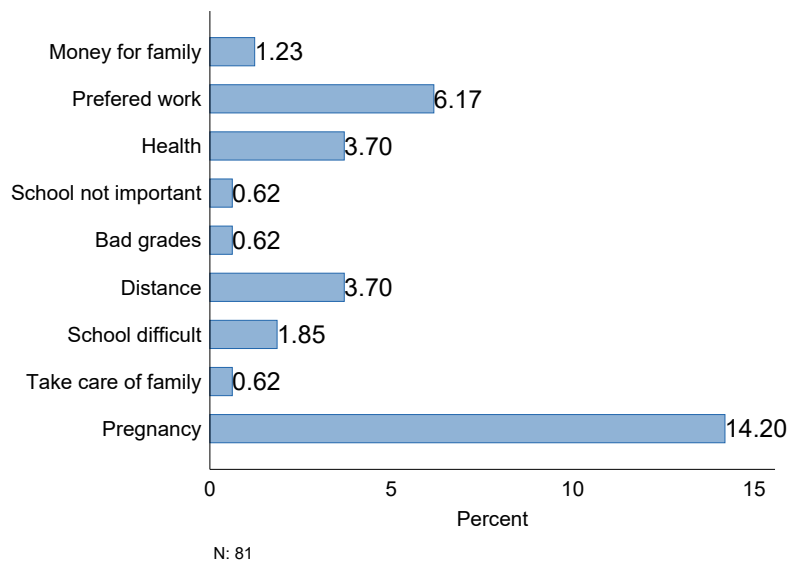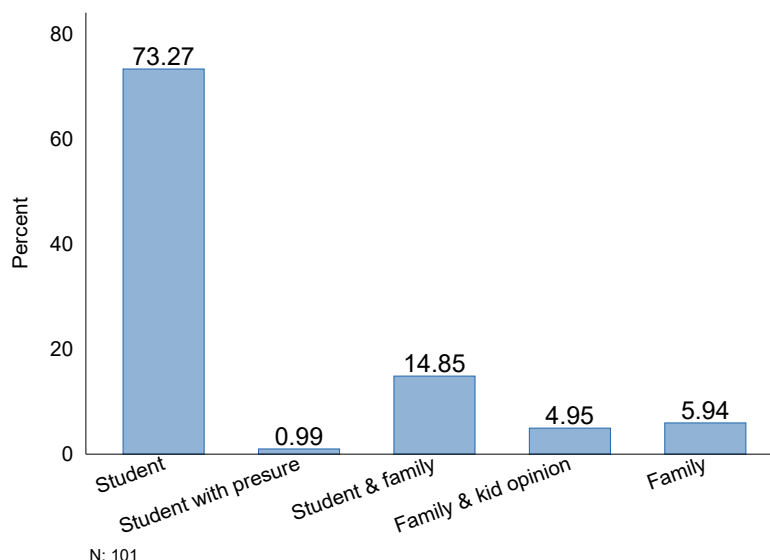
Figure A.3: Reasons to dropout school

N: 81

Figure A.4: Who decided to stop attending school

student leave school.

A.3   Labor

An important factor that makes students dropout is child labor that interferes with their ability to attend regular school. We asked students about their labor experience and Figure A.5 shows this information. The graph shows that the majority of children has not had a paid or unpaid job recently, but there is an important percentage that work while they are still studying. We can separate this information by gender to see who is more likely to get a job while they are in school. In Figure A.6, we can see that male students are more likely to search and get a job when they are studying at school. It is also important to observe the intensity of the job students do in terms of hours per day. Figure A.7 below shows that female students tend to work less hours during week than male, whose hours worked weekly are more distributed in the intervals with longer time period, while females are pretty concentrated in the first interval of hours.

A.4   Performance self perception

The In-Depth survey ask students about their academic performance self-perception. Figure A.8 shows the subjects where students feel more confident about their performance. Surprisingly the surveyed students answer that they feel more comfortable in mathematics, subject that is usually the most difficult to approve.

Figure A.5: Has had a paid or unpaid job
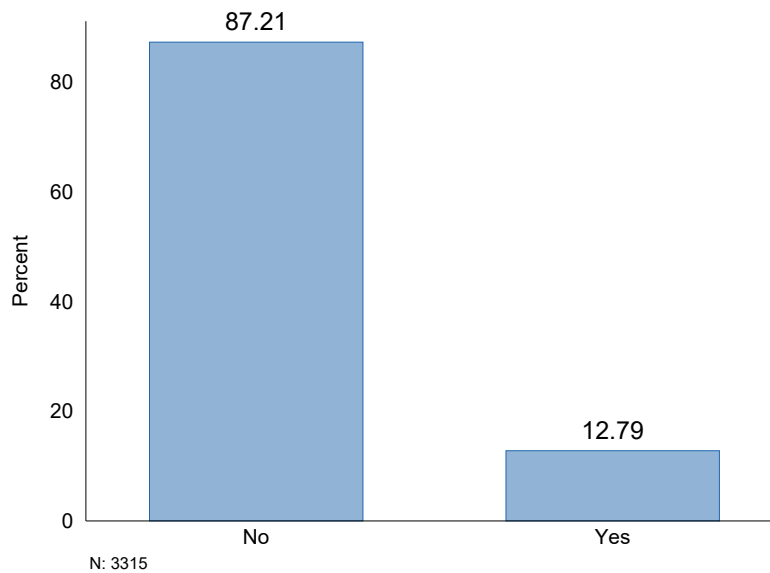

N: 3315

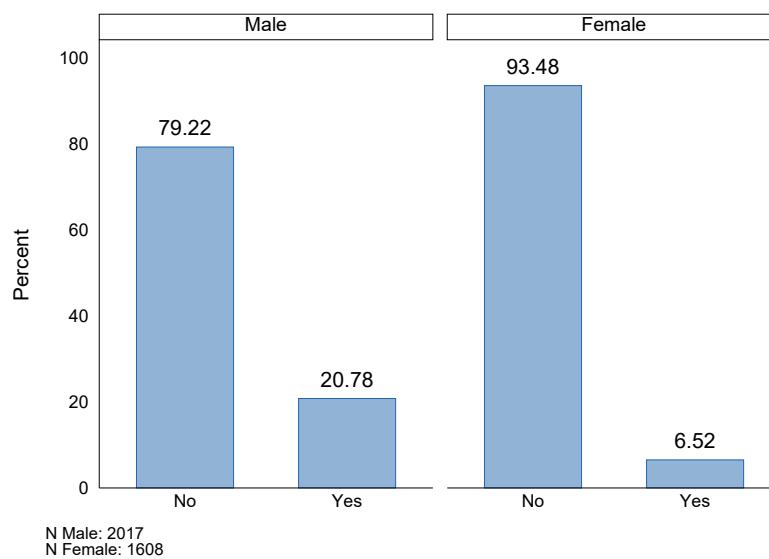Figure A.6: Has had a paid or unpaid job by gender

N Male: 2017
N Female: 1608

Figure A.7: Amount of hours worked weekly by gender

N Male: 2017
N Female: 1608
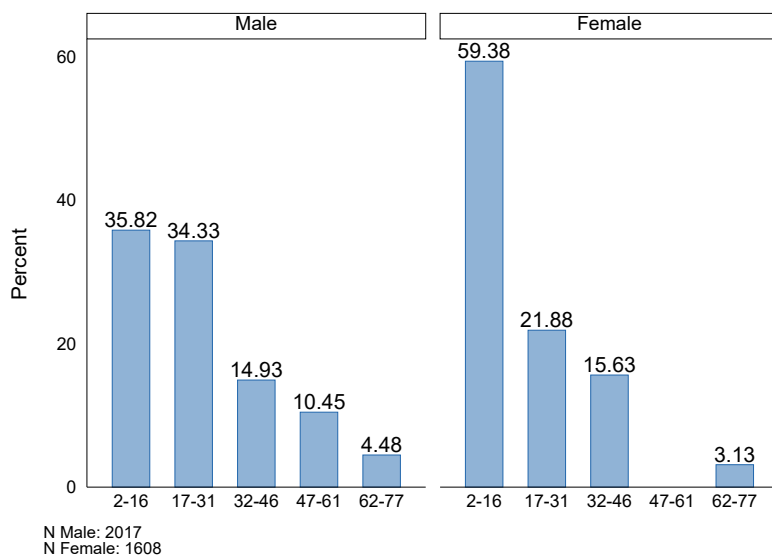
Figure A.8: Subjects with high performance

N: 3625
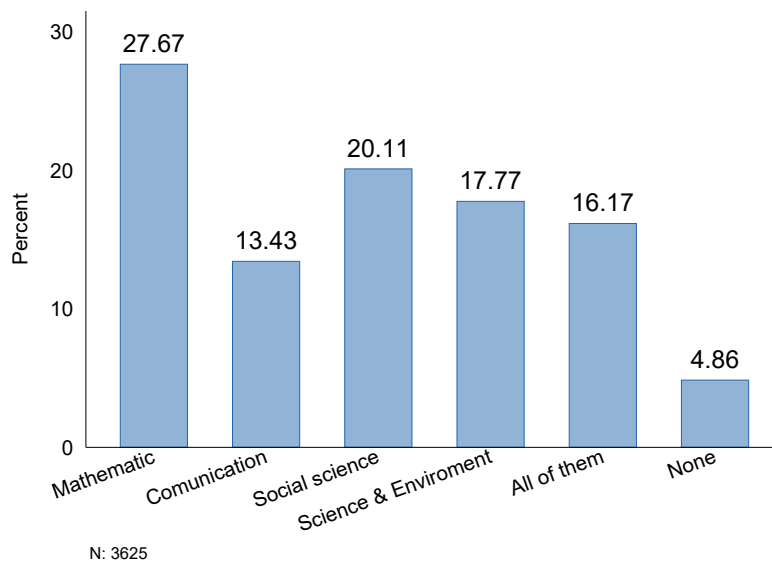
Figure A.9: Salary expectation by career

N: 1366
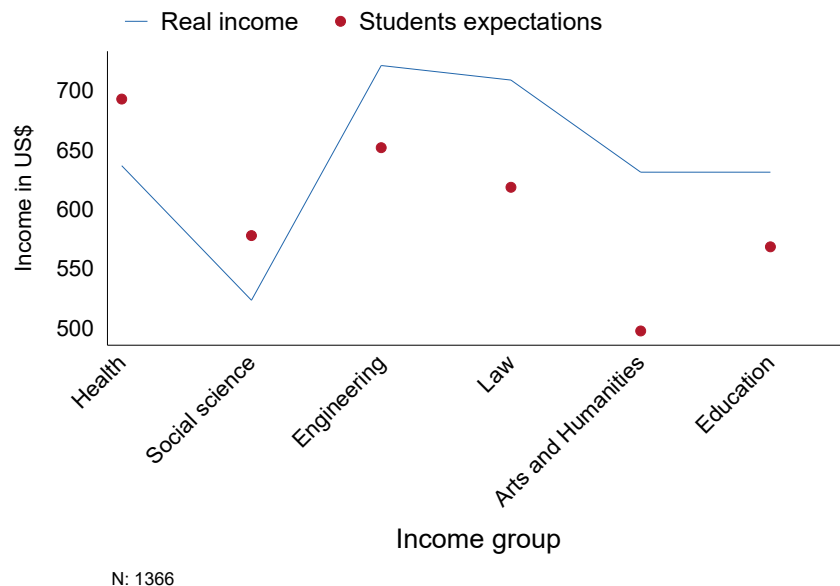
A.5 Salary Expectations

A factor that make students dropout of school is the immediate incentive that they see in their daily lives and one of the most important is money. To see their thinking about it, we asked students to classify 100 people in 5 different income groups for each level of education, these results are in Figure B.2 and Figure B.1 in the appendix and Figure 1.

We can observe how students place higher amount of people in higher income groups as the education level increase. This tell us that students on average know that higher education level increase their salary significantly, but the thing is how much more money they think they could make. That is why this survey asks for the salary they believe would get by academic area. This is shown in Figure A.9.

The careers that students think that is the most lucrative belong to Health area with a monthly salary of 693 US$. This one is followed by Engineering and Law with monthly paid of 648 and 606 US$ respectively. These wages reflect that students think that a professional gets more money but the numbers they expect are below the real mean salary of a person with a college degree. Figure A.10 segregate this information by gender.

It is possible to observe female students has a monthly expected salary higher than males for each one of the careers proposed. This could tell us that girls should be more focused in their studies because of the higher expected return they believe. This could explain why the students prefer certain professions compared to other. This is shown in Figure A.11.

Figure A.10: Salary expectation by gender

N Male: 2017
N Female: 1608
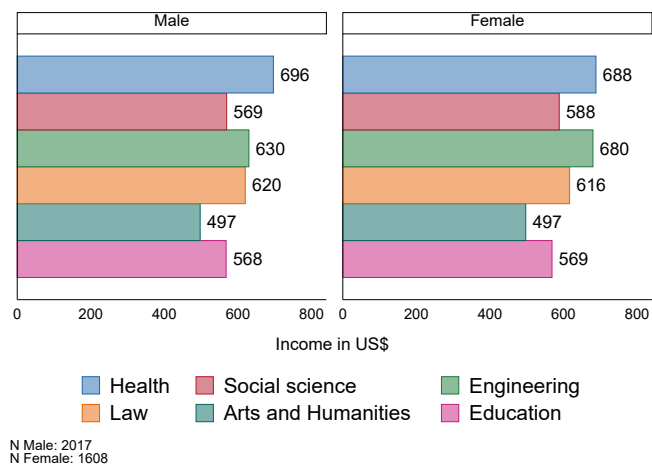
Figure A.11: Careers area preferred

N: 1366
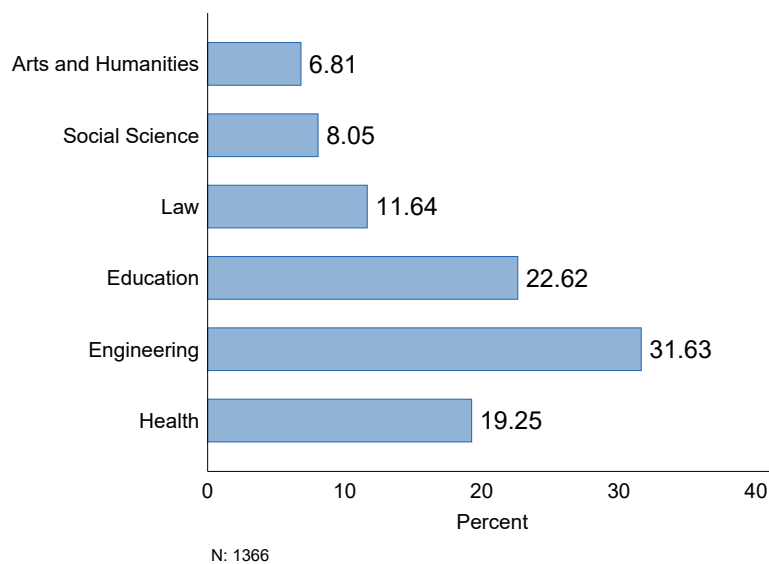
Figure A.12: Time use weekly
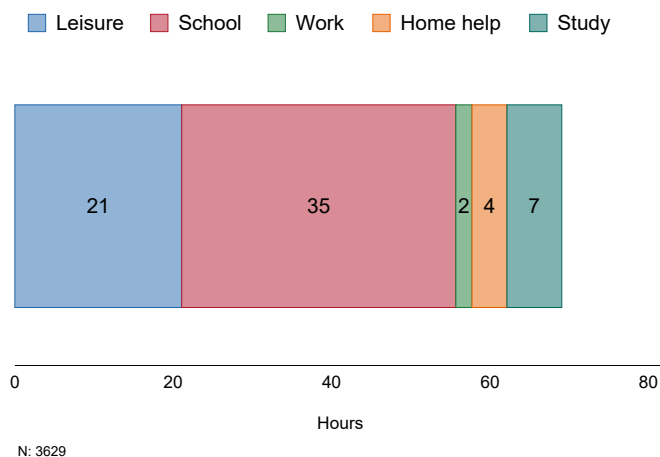
This shows that Health and Engineering are the most preferred careers among the surveyed students, which represent the highest income expectations in the previous graph. This could mean that believes about the income expectations affects the career choice of students.

A.6   Time use

An important segment of the In-Depth survey is the Time Use questions. This section tries to comprehend what activities students spent their time. We classify this activities in five different categories: Leisure, School, Work, Home help and Study. Figure A.12 shows the time use declared by the students surveyed.

It is predictable that the most part of time is englobed in school. But, it is interesting to see that students don't spend time studying at home (1 hour per day on average) and the rest of time they do leisure activities. This could reflect a low performance in the academic activities like exams in school and national exams. This information is divided in Figure B.4, where we can observe that male students spend 3 more hours on average working than female, this is consistent with previous graphs. In the same sense, female students spend more time helping at home and have less leisure than male students. Also, female students spent more time studying at home, which represent that girls have more dedication than males in their academic activities.

A.7   In-Depth household

The household section in the In-Depth survey asks about the performance they think their children have in school. These gives us an idea of how much parents are concerned about how their children do in school and the incentive they could transmit to children. It also searches for information about the access of students to technology and different tools to improve the education process.

Figure A.13: Subjects with high performance according parents
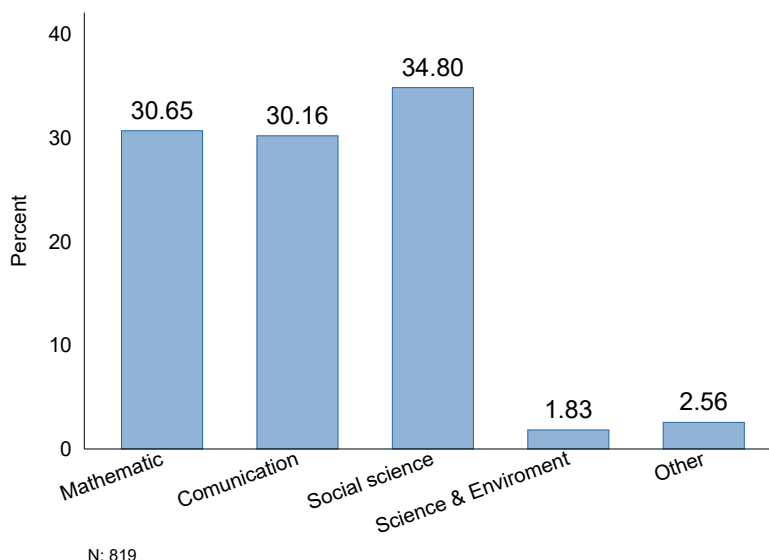
The following graphs are a sample of the information we can extract from the data collected about households.

A.8   Child performance

Figure A.13 shows the subjects parents think their children do best in school, and show some interesting results. We can see that parents believe students have a good performance in the main subjects (math, communication and social sciences). These correspond to student's answers in the last section.

We also asked about the performance in detail for math and language, to see if the performance believes for students and parents are aligned. These information is presented in Figure A.14.

The graphs explain that the responses are pretty similar, where there is a higher confidence in language subject than math. Looks like parents and students have the same self-perception about student's performance in school.

These graphs previously presented are just some descriptive statistics that we can extract from all this process of data collection. With more work and time, it is possible to get additional and interesting results that helps us to understand in more detail the life conditions in which Dominican Republic students and their believes about education returns.

Figure A.14: Performance in math (left) according and language (right) to parents

N 819
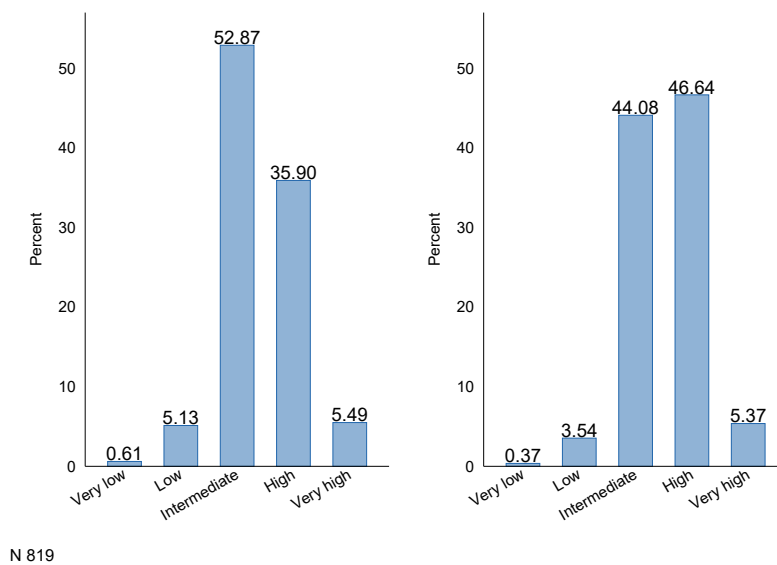
B   Tables and Figures

Table B.1: Treatment groups by number of schools and students for the 2015-2016 school period (first year)

Treatment group	Number of Schools	Number of Students
Informative videos	200	21,279
Persuasive videos	198	23,205
Control	201	21,268
Total	599	65,752

Figure B.1: Expected vs. real income group proportions of K-12 graduates
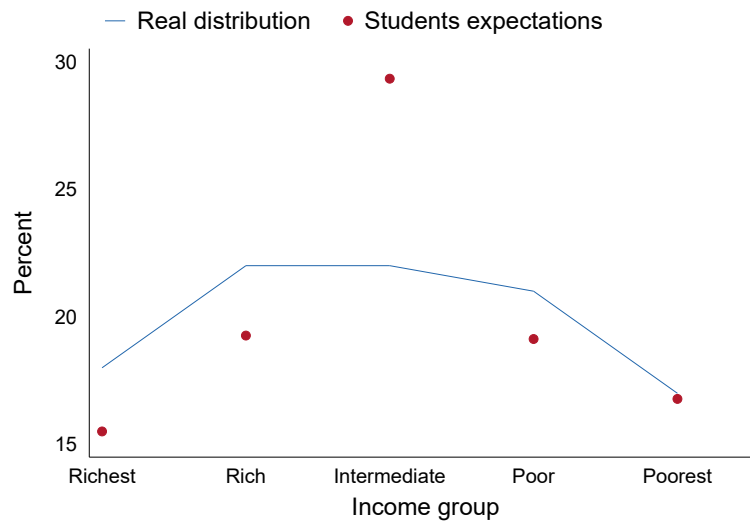
Table B.2: First-year treatment effect on dropout

	(1) Probit	(2) Regression
Informative video	-0.00190 (0.00975)	-0.00191 (0.00978)
Persuasive video	-0.00259 (0.0105)	-0.00260 (0.0105)
Grade FE	Yes	Yes
Observations	65752	65752

Standard errors in parentheses

Cluster by school

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure B.2: Expected vs. real income group proportions of people who did not complete highschool
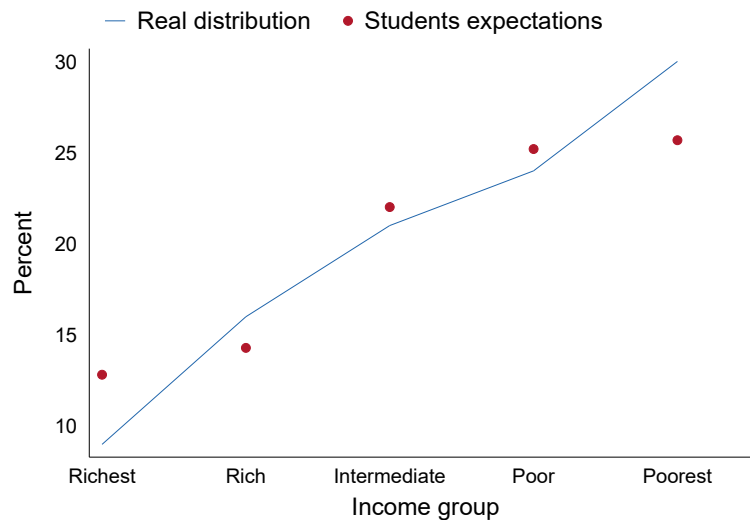
Table B.3: Second-year treatment effect on dropout by grade (probit)

	(1) 7th grade	(2) 8th grade	(3) 9th grade	(4) 10th grade	(5) 11th grade
Informative video	0.00290	0.00375	-0.0104	-0.00951	-0.0220**
	(0.00764)	(0.00571)	(0.0111)	(0.0121)	(0.0110)
Persuasive video	0.00133	0.00524	0.000561	-0.0132	-0.0171
	(0.00780)	(0.00563)	(0.0128)	(0.0117)	(0.0110)
Informative video previous year	0	-0.0272***	-0.0370***	0	0
	(.)	(0.00782)	(0.00942)	(.)	(.)
Persuasive video previous year	0	-0.0188**	-0.0523***	0	0
	(.)	(0.00818)	(0.0105)	(.)	(.)
Observations	103635	99403	91188	77810	56364

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.4: Second-year treatment effect on dropout by grade (OLS)

	(1) 7th grade	(2) 8th grade	(3) 9th grade	(4) 10th grade	(5) 11th grade
Informative video	0.00290	0.00380	-0.0104	-0.00959	-0.0220**
	(0.00764)	(0.00580)	(0.0112)	(0.0122)	(0.0109)
Persuasive video	0.00132	0.00536	0.000464	-0.0132	-0.0173
	(0.00777)	(0.00575)	(0.0132)	(0.0117)	(0.0110)
Informative video previous year	0	-0.0259***	-0.0334***	0	0
	(.)	(0.00721)	(0.00795)	(.)	(.)
Persuasive video previous year	0	-0.0185**	-0.0469***	0	0
	(.)	(0.00785)	(0.00914)	(.)	(.)
Observations	103635	99403	91188	77810	56364

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure B.3: Effect on overall test scores by percentile
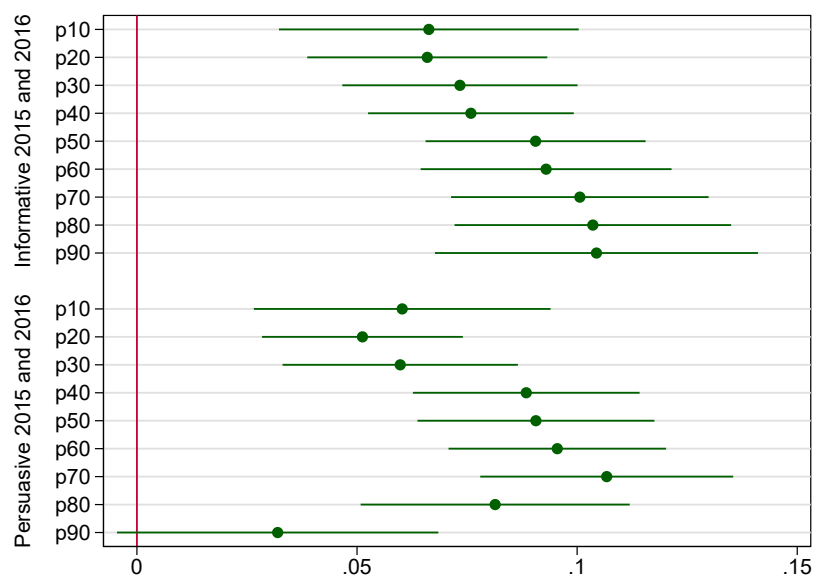
Figure B.4: Students time use by gender

N Male: 2017
N Female: 1608
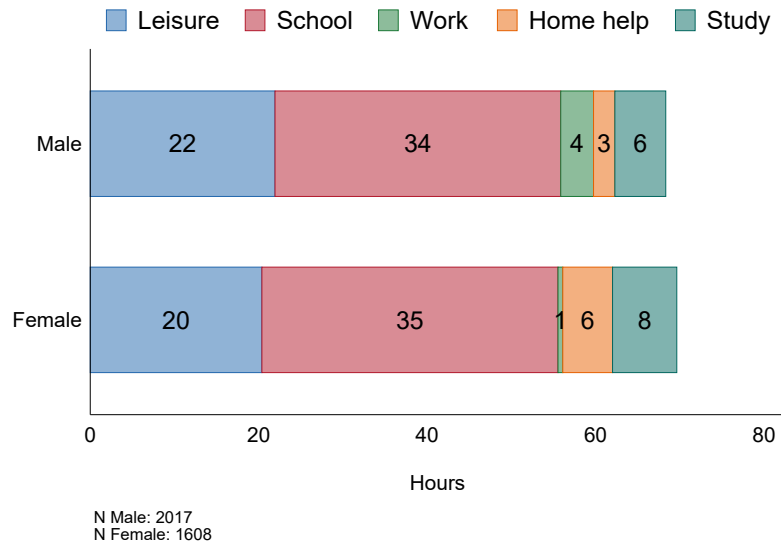
Figure B.5: Expected vs. real income group proportions of university graduates

N: 1366

C   Project Timeline

Year	2001				2005		2010				2011			
Month	Q1	Q2	Q3	Q4	S1	S2	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

🟠 **Robert Jensen's study** on the impact of
🔴 information on the Returns of Education on the
🟢 Demand for Schooling in the Dominican Republic..
[2,250 eighth grade students are included in the
sample and they are followed up for five years]

🟣 Robert Jensen's study is published in *The
Quarterly Journal of Economics* as "**The
(Perceived) Returns to Education and the
Demand for Schooling**"

Main Finding: Boys in treatment group increased
attendance 0.2 to 0.35 additional years of
schooling over the next four years relative to
control group.

🟣 Initial conversations between **J-
PAL LAC, USAID and the Ministry
of Education of the Dominican
Republic** for replicating the study
of Robert Jensen.

🟥 Field I: Self-administered in-school surveys   🟧 Field II: in depth surveys, focal sessions and pilots   🟩 Implementation   🟪 Other relevant activity

Year: 12 12 12 12 12 12 12 12 12 12 12 12 13 13 13 13 13 13 13 13 13 13 13 13 14 14 14 14 14 14 14 14 14 14 14 14

Month: 01 02 03 04 05 06 07 08 09 10 11 12 01 02 03 04 05 06 07 08 09 10 11 12 01 02 03 04 05 06 07 08 09 10 11 12

🟠 **First diagnostic survey** on beliefs of education.

🟠 **First session of focal groups** regarding education beliefs.

🟠 **Second diagnostic survey** on 6th grade students and head of households.

🟠 **Second session of focal groups** regarding education and labor beliefs.

🟠 **Baseline Survey Pilot**
- Sept-14.

🔴 **Baseline Survey**
- Oct-14 to Dec-14.
- 600 schools.
- 39,000 surveys (7th & 8th grade).

🟠 **First treatment pilot** of delivery of returns of education.

Beginning of Fundación Inicia funding (Mid-2012): **USD 100,000**

Beginning of USAID DIV funding (August-14): **USD 1,258,979**

42

🟥 Field I: Self-administered in-school surveys 🟧 Field II: in depth surveys, focal sessions and pilots 🟩 Implementation 🟪 Other relevant activity

Year	15	15	15	15	15	15	15	15	15	15	15	15	16	16	16	16	16	16	16	16	16	16	16	16	17	17	17	17	17	17	17	17	17	17	17	17
Month	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12

Statistics and figures for the elaboration of videos.
- Dec-14 to Mar-15.

In Depth Survey 2015:
- Apr-15 to May-15.
- 5,600 students (7th & 8th grade).
- 2000 household surveys.

Implementation 2015:
- May-15.
- Videos delivered to 400 schools.
- 44,500 students (7th & 8th grade).

Follow Up Survey:
- May-15.
- 600 schools.
- 36,000 surveys (7th & 8th grade).

Implementation 2016:
- Feb-16 to Apr-16.
- Videos delivered to 1,594 schools.
- 265,000 students (7th to 12th grade).

End Line Survey:
- May-16 to Jun-16.
- 1,550 schools.
- 72,000 surveys (8th to 12th grade).

In Depth Survey 2016:
- May-16 to Jun-16.
- 580 household surveys (including students, 8th & 9th grade).

School Directors Survey:
- May-16 to Jun-16.
- 600 directors of private schools.

Extension of USAID DIV funding (July-16): **USD 510,000**

In Depth Survey 2016/2017:
- Oct-16 to Apr-17.
- 3,625 students (8th & 9th grade).
- 821 household surveys.

End of USAID DIV funding (June-17)

Legend:
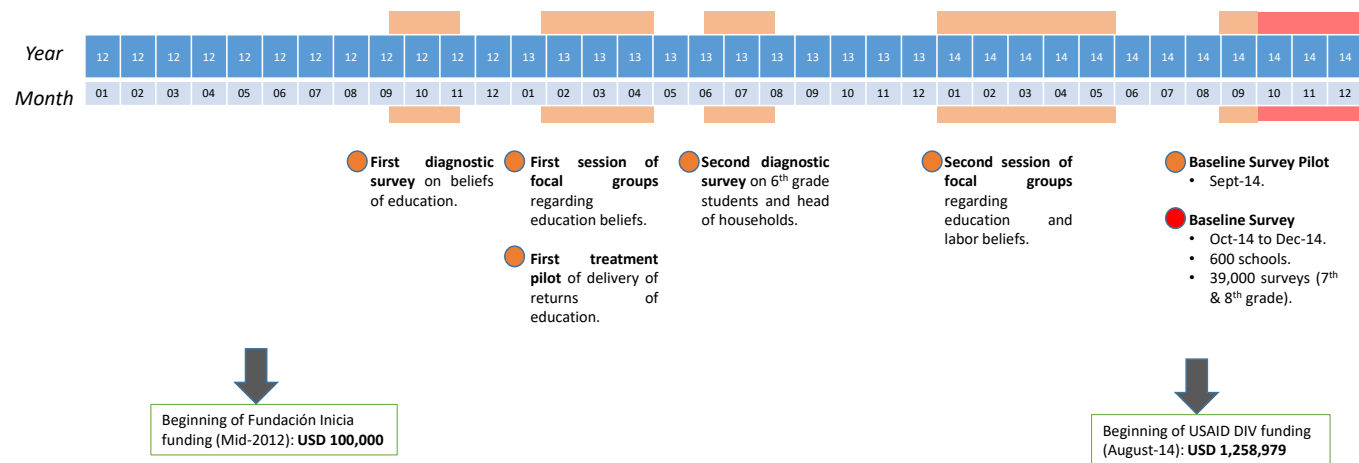- Field I: Self-administered in-school surveys
- Field II: in depth surveys, focal sessions and pilots
- Implementation
- Other relevant activity