Research Information and the Last-Mile: Evidence from a Scale-Up Experiment*

Patrick Agte Daniel Morales Christopher Neilson
Sebastián Otero Gautam Rao*

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Abstract

Recent evidence suggests that sharing research findings with policymakers can increase the adoption of effective policies. We conduct a field experiment to study whether evidence of policy effectiveness can promote compliance among managers responsible for implementing approved policies. We leverage a nationwide mandated scale-up of a new education policy in the Dominican Republic that had been shown to be effective in improving student outcomes in the same context. We find that sharing research findings with school officials did not increase implementation rates, and evidence suggests this was not due to inattention or limited understanding of the information.

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1 Introduction

Numerous research studies have highlighted the difficulties associated with scaling up successful interventions that are supported by scientific evidence (Banerjee et al., 2017; List, 2022). These studies shed light on the challenges encountered at various levels of the organizational hierarchy, affecting both top-level decision-makers and lower-level workers responsible for implementation. As a result, the widespread adoption of innovative ideas and practices is significantly hindered.

Technology adoption is especially slow in the public sector, where managers face little monitoring (Finan et al., 2017), and lack the incentives to introduce innovative policies (Muralidharan and Singh, 2020), which can be disruptive to the status quo and costly to implement. Without external pressure, incorrect beliefs and risk aversion of government officials could constitute important barriers to the adoption of new policies. In such settings, providing evidence-based findings on the effectiveness of new interventions has the potential to encourage adoption in the last mile by correcting beliefs or decreasing uncertainty. This idea is inspired by recent evidence that shows that access to research findings can increase the adoption of successful interventions among policymakers (Hjort et al., 2021).

In this paper, we examine a setting in which policymakers had already decided to scale up a successful policy intervention but delegated its implementation to lower-level public managers. In partnership with the Ministry of Education of the Dominican Republic, we conducted a randomized controlled trial involving all secondary schools in the country to test whether sharing research findings with school principals—who are responsible for implementation—could improve the scale-up of a proven educational information campaign

The "Aprendiendo el Valor de la Educación" (AVE) program is an educational information campaign for students in grades 7 to 12. It presents information on the benefits and costs of schooling through engaging videos. Inspired by Jensen (2010), which showed that correcting students' misperceptions about the returns to education can increase schooling, the AVE program was designed to be scalable and cost-effective, replacing the face-to-face interactions of the original intervention with easily distributed classroom videos.

The AVE program was first implemented in a randomly selected subset of schools

and evaluated by Berry et al. (2019). The evaluation showed positive impacts: test scores increased by 0.05 standard deviations and dropout rates declined by 3 percentage points in the following year. Buoyed by these promising outcomes, the Ministry of Education decided to scale up the program nationwide and integrate it into the official school calendar. While the initial AVE program involved extensive in-person workshops for implementing school officials, the scale-up relied on standard government communication channels, with instructions delivered to principals via email and phone calls from the Ministry of Education.

In partnership with the government, we conducted a scale-up experiment to test whether sharing the research findings from Berry et al. (2019) with implementing school officials could increase adoption of the AVE program during its nationwide expansion. All secondary schools were randomly assigned to either a "No Evidence" or an "Evidence" group. In the No Evidence group, principals received an email with detailed implementation guidelines and two follow-up phone calls reviewing the instructions and explaining how to show the videos. The Evidence group received the same communications, supplemented with information on the AVE program's positive evaluation results from the original experiment. This additional content was highlighted in the email and conveyed during each of the phone calls by enumerators following a script that emphasized the program's proven effectiveness.

To benchmark the effectiveness of the evidence-based approach against other strategies the government might have used to boost adoption, we cross-randomized two additional interventions. In the "Incentive" group, principals were entered into a lottery for a financial reward conditional on implementation. In the "Intensity" group, principals received two additional follow-up calls to reinforce the implementation request.

To measure program adoption, principals were asked to submit a form and a photo of students watching the videos, which served as evidence of implementation for the Ministry of Education. We also collected data through student self-reports on whether the program was implemented at their schools. The delivery of emails and phone calls was closely monitored by our research team, ensuring high compliance. Notably, we achieved broad reach, with 98% of principals receiving the initial email and 95% receiving the first phone call.

Our empirical analysis yields three main findings. First, overall program adoption was modest: only 58% of principals submitted either a form or a photo to the government, and just 49% of students reported that the school participated in the program. This stands in contrast to the 97% compliance rate observed in the initial AVE experiment, suggesting that extensive in-person interactions may be necessary to achieve high take-up rates. Second, precise estimates indicate that neither sharing research findings nor financial incentives increased adoption. Heterogeneity analysis and a follow-up experiment with the same sample of school officials suggest that the null effect of the evidence treatment cannot be explained by beliefs about the effects of the AVE program, a lack of statistical knowledge, or inattention to the information. Third, we find that the two additional follow-up calls in the "Intensity" treatment arm increase program adoption by 30%. This result highlights the importance of monitoring in driving implementation, even when policies are low-cost and well-aligned with official priorities.

Our results suggest that limited knowledge of a policy's effectiveness is not, in itself, a binding constraint at the implementation stage in this context. This insight, combined with the high take-up rates observed in the initial AVE experiment, suggests that standard government communication channels alone may be insufficient to engage implementing officials such as school principals. Given their limited bandwidth, more active forms of engagement—such as dissemination workshops—may be necessary to support the successful adoption of new policies.

Our findings contribute to the existing literature on the scale-up of successful policies (Banerjee et al., 2016; Bold et al., 2018) and the adoption of new technologies in firms (Bloom et al., 2012; Atkin et al., 2017). Our study is also closely related to research exploring how policy decision-makers and implementers respond to scientific evidence and new data (Hjort et al., 2021; Banuri et al., 2019; Rogger and Somani, 2018; Vivalt and Coville, 2023). Relative to previous studies, our paper provides two distinct contributions. First, the evidence we present is based on the same policy that needs to be implemented, offering direct insights into the effectiveness of the intervention itself. Second, we specifically focus on the implementation of the program by lower-level managers who are responsible for overseeing its execution, rather than examining the adoption of policies by high-level policymakers.

Additionally, our findings align with a growing body of research showing that information provision alone is often insufficient to induce meaningful behavioral change in individuals and firms (DellaVigna and Linos, 2022). Active involvement is crucial for driving meaningful change (Oreopoulos and Ford, 2019; Bloom et al., 2012). Overall, our research offers new insights into policy implementation and underscores the critical role of monitoring in ensuring successful policy adoption.

The remainder of the paper is organized as follows. Section 2 describes the setting and institutional background, and Section 3 lays out the experiment. In Section 4 and 5, we present the empirical strategy and results. Finally, Section 6 discusses the main results, and Section 7 concludes.

2 Background information

The education system in the Dominican Republic consists of six years of primary education and six years of secondary education. Seventy-seven percent of secondary schools are public. Secondary schools are run by school principals who are appointed by the Ministry of Education in the public sector. Principals have wide-ranging authority within the school but need to follow the official school curriculum designed by the Ministry of Education. Schools are organized in 122 educational districts.

School quality is low, and dropout is widespread. The Dominican Republic ranked last in international student performance assessments in 2013 and 2015 (UNESCO, 2015; OECD, 2016), and approximately 34 percent of students who take the 8th-grade national exam do not complete high school. One of the factors that contribute to high dropout rates is that students underestimate the returns to schooling (Jensen, 2010).

Motivated by this finding, the Ministry of Education collaborated with academics to create a scalable version of an education information campaign. This partnership resulted in the development of the "Aprendiendo el Valor de la Educación" (AVE) program, which comprises four 15-minute videos designed to provide secondary school students with information about the potential monetary and non-monetary benefits of education. Earnings information was obtained based on nationally representative surveys and presented in a comprehensible manner. For instance, wages are discussed by showing the distribution of wages for 100 representative adults for a given level of schooling. The videos also elucidated how various factors, such as luck and student

performance, contribute to the heterogeneity of outcomes. The program implementation involved students watching the videos during class and engaging in subsequent discussions with their teachers. This interactive approach aimed to foster a deeper understanding of the content and encourage students to reflect on the implications of education in their own lives.

The program was evaluated in a randomized field experiment conducted in 2015 and 2016, as outlined by Berry et al. (2019). In the initial round of the study in 2015, the Ministry of Education selected 398 treatment schools to implement the program for 7th and 8th-grade students. School officials from all treated institutions were required to attend a two-day workshop in Santo Domingo, during which they received physical copies of the videos and detailed instructions for implementation. Subsequently, schools received multiple follow-up phone calls to ensure program adherence.

In the second round of the study in 2016, the program increased its reach to include students from all secondary school grades (from 7th to 12th grade) across 1,600 schools. Due to the larger sample size, the program was implemented in a decentralized manner. The Ministry of Education initially provided the program material to the educational districts, which then organized in-person workshops with local schools to facilitate program implementation. The take-up rates were 97% in the first round and 80% in the second group. Intent-to-treat estimates from Berry et al. (2019) reveal that the AVE program increased test scores by 0.05 standard deviations and reduced dropout rates in the following year by 0.03 percentage points.

Building on these findings, the Ministry of Education made the decision to expand the implementation of the AVE program in the 2018-19 academic year. Under the new initiative, every student enrolled in 7th grade or above was required to watch the program's videos within the school setting. To facilitate this, the government designated a specific week, known as AVE week, and incorporated the intervention into the official school calendar, specifically during the week of September 24-28 (refer to Online Figure B.1 for reference).

To enable the program's implementation at a larger scale, the government made modifications to the implementation approach. Instead of conducting in-person workshops with principals, the scaled-up version of the program instructed principals to download the necessary materials, including the videos and implementation protocols,

from an online platform. These instructions and protocols were directly communicated to principals via phone and email.

3 Experimental design

After the Ministry of Education decided to scale up the program and how to communicate the instructions to principals, we partnered with them to investigate whether sharing the evaluation results of the initial field experiment increases program adoption.

3.1 Sample selection

Our sample encompasses all secondary school principals in the Dominican Republic, comprising a total of 4,351 schools across grades 7 to 12. We excluded schools without secondary school students during the 2017-2018 academic year or those with fewer than five students enrolled in any secondary school grade during the 2016-2017 academic year.[1] We further restricted the sample to the 3,881 schools that participated in either the 8th-grade National Exam in 2016 or the 12th-grade National Exam in 2018, effectively excluding informal schools from our analysis.

In cases where principals supervised multiple schools meeting our sample criteria, one school was randomly selected, and the others were excluded. Among the remaining 3,762 schools, we dropped those for which we did not possess a valid phone number and email address for the principal at the beginning of the intervention. Additionally, schools that were inaccessible during our baseline survey or were utilized for piloting purposes were also excluded. Ultimately, our final sample consisted of 2,724 principals. For a detailed breakdown of the sample selection process, please refer to Table A.1 in Appendix A.

3.2 Implementation protocol

All principals included in our sample were recipients of a series of communications leading up to the AVE week. These communications were sent from the official email account and phone number of the Ministry of Education. The communication strategy

[1]Since the final enrollment data for 2017-18 was not available by the start of the survey, we relied on the data from the previous year.

consisted of three emails and one phone call. On August 10th, the first email was sent to all principals in the sample. It contained important components, including a direct link to the AVE platform where principals could access and download the program's videos and implementation protocol. Additionally, the email included a brochure that provided comprehensive information about the AVE campaign, along with precise instructions to guide principals through the process of downloading the necessary materials from the AVE platform. The initial email was followed by a reminder phone call and a second email that repeated the instructions. Lastly, on September 24th, the first day of the AVE week, a revised email was sent to principals. This email, referred to as the "first redesigned email," contained the same essential information as the previous communications but had an enhanced visual design. The aim was to make the email more visually appealing, further motivating principals to take prompt action.

As part of the instructions outlined in the email and implementation protocols, the Ministry of Education requested that principals complete a form and provide a photo showing students engaged in watching the AVE program. This requirement served as evidence of the school's successful implementation of the AVE program. Principals were given until October 3rd to submit these materials. However, initial take-up rates were relatively modest, with only 41% of principals having uploaded a photo two weeks after the conclusion of the AVE week. To address this, an additional email, referred to as the "second redesigned email," was sent to all principals on October 11. This email contained the same instructions and information as the previous communications, aiming to remind and encourage principals to fulfill the submission requirement. Following the second email, a follow-up call was made to all principals to further reinforce the importance of compliance.

Figure A.1 provides a visual depiction of the timeline and sequence of these interventions. While the second round of emails and calls appeared to have a positive impact on overall take-up rates, our analysis does not reveal differential treatment effects between the first and second rounds. Therefore, we focus our analysis on the final take-up of the AVE program after both emails were sent out.

3.3 Treatment arms

The main focus of our research study was to examine the impact of sharing research findings with school principals on program adoption. With this goal, we divided our sample into the "Evidence" and "No Evidence" treatment arms. In order to establish a benchmark for comparison relative to other potential strategies that the government could have employed to enhance program adoption, we also implemented two additional treatment arms: the "Incentive" treatment arm and the "Intensity" treatment arm. We next describe each treatment arm in detail.

Evidence Treatment. In the first treatment arm, principals received information about the results of the AVE pilot. Specifically, the email and phone calls script included the following paragraph:

> *It is important to note that a research study, carried out between 2014 and 2016 in 2,500 schools in the Dominican Republic, showed that implementing this campaign significantly improves scores on national tests and decreases dropout rates. The schools that showed the videos increased national test scores by 0.6 points in total. This study shows that if all the schools in the country showed these videos to their students, the number of dropouts in secondary schools would decrease by 6,500 students per year."*

This information was also conveyed through easy-to-read figures in the brochure included in the first two emails. Figure B.2 and B.3 shows these brochures. In the redesigned emails, we included these figures in the body of the email.

Incentive Treatment. In a second treatment arm, principals received a financial incentive in the form of a lottery. The first two emails and the call scripts included this extra paragraph:

> *Please note that you have been randomly selected to be one of the directors who can participate in the draw for a Samsung tablet to help you run the school. You will enter this lottery only if you implement the AVE campaign at your school as outlined in the instructions below in this email. One out of 10 people who enter the drawing will win a tablet.*

The value of the tablets was equal to 16% of the average monthly salary of a school

principal. This treatment was expected to serve as a monetary benchmark to anchor the effectiveness of other treatment arms.

Intensity Treatment. In a third treatment arm, principals received two additional calls from MINERD. The first follow-up call was between September 18th and 21st, after every school in the sample received the standard call. The second follow-up call was implemented during the AVE week.

Randomization was conducted at the school level and stratified by school district. We cross-randomized the three treatments, with the exception that the intensity group never received the financial incentive.[2] We followed this procedure since we expected that the intensity and the incentive treatments would already lead to high take-up rates. In total, we had 6 different treatment arms. We present the sample size and treatment arms in Figure A.2.

4 Data and empirical strategy

We use a combination of administrative and survey data to evaluate the different interventions. We have access to the school registry, enrollment data, and test scores from the national exams in 8th grade and 12th grade. We initially obtained contact details for all schools from the school registry provided by the Ministry of Education. We then set up a call center to update the contact details of each school principal. After that, we conducted a baseline phone survey in which we collected information on the baseline beliefs of school principals and school characteristics.

To facilitate communication with each principal, we utilized an email marketing platform, acting as a liaison on behalf of the Ministry of Education. This platform not only facilitated the delivery of instructions but also provided us with valuable insights by tracking various engagement metrics. We were able to determine whether each principal received and opened the email, as well as whether they chose to download the attached brochure. The email itself contained links to an online platform in which the principal had to register to download the AVE informational campaign material. We use this registration information to monitor the implementation of the policy. We

[2]The original design included a fourth treatment arm that provided principals with additional assistance through a helpline and a link to a website with further information. Since we do not find that principals made use of the helpline, we do not report the results of the assistance treatment in this paper. We still include an assistance treatment dummy in each regression.

also recorded and kept track of all phone calls performed by the enumerators. We refer to the email and call data as the implementation outcomes.

After showing the AVE videos to their students, principals were instructed to submit a photo via WhatsApp and submit a form with the implementation details via email. We use these outcomes as indicator variables of task completion. We supplement these outcomes with additional information gathered through student questionnaires. Specifically, for schools that participated in the 12th-grade national exam in 2019, we included questions in the national exam asking students whether their school had participated in the AVE campaign during the 2018-2019 academic year.

The primary treatment effects of interest are estimated by calculating the intent-to-treat (ITT) estimate of take-up via OLS:

$$Y_i = \sum_k \beta^k \cdot T_i^k + X_i'\gamma + \epsilon_i \tag{1}$$

where Y denotes the outcome for principal i, T^k is an indicator for assignment into the treatment arm k, and coefficients β^k are the parameters of interest. The vector X_i includes stratification dummies and baseline covariates selected via the double lasso approach by Belloni et al. (2014) from Appendix Table A.2 covariates.

4.1 Descriptive statistics and balance checks

Table A.2 shows summary statistics and balance across treatment arms. Panel A reports the characteristics of schools and Panel B reports characteristics of principals. The average school in the control group consists of 224 students. Seventy-six percent of the schools in our sample were public and 73% were located in urban areas. Most schools had the necessary infrastructure to easily implement the AVE campaign, including electricity (99%), a projector (77%), and an internet connection (72%). If a school did not have an internet connection, a principal could have downloaded the campaign material in a cybercafe. Thirteen percent of schools share the same building with another sample school.[3] One-third of the sample was part of the treatment group in the previous pilot study of the AVE program. Around half of the principals think

[3]Due to limited infrastructure, some schools operate in a shift system in which one school uses the building in the morning and another school uses the building in the afternoon. Both schools would have separate principals and student bodies.

that students undervalue education and 83% percent of them believe that providing information on the benefits of completing schooling would significantly improve test scores and decrease dropout rates. We treat these outcomes with caution since they might suffer from reporting bias. Even so, these shares suggest that incorrect beliefs might prevent some principals from adopting the AVE campaign. The treatment and control groups are largely balanced across school and principal characteristics.

5 Results

In this section, we describe the results. We start by examining implementation outcomes. Next, we show program adoption outcomes by treatment status.

We report treatment effects for various implementation outcomes in Tables A.3 and A.4. We first show that we managed to reach almost all the principals in our sample. Ninety-eight percent of the principals received the initial email that we sent to them and 75% opened it. Ninety-five percent of principals also received the first call, in which we reiterated the information we provided in the email.

Table 1 reports the regression results for our primary measures of program adoption, before and after the follow-up calls were made. Specifically, we report whether the principal downloaded the material (columns 1 and 4), submitted a photo of students participating in the AVE program via WhatsApp (columns 2 and 5), whether the principal submitted the mandatory form via email (columns 3 and 6), and whether at least 50% of students in a school report in the 12th-grade national exam that either they or other students at their school participated in the AVE campaign in the 2018-2019 academic year (column 7). The last outcome is only available for approximately half of our sample since not all secondary schools offer the 12th-grade national exam.

Overall take-up was modest, with only around half of the schools submitting proof for the implementation of the AVE campaign. Across all outcomes, we observe no significant treatment effects for the evidence or incentive treatments.[4]

The only intervention that managed to improve program adoption is the intensity treatment. The positive treatment effects for the intensity group hold across all

[4]The only exception is that the incentive treatment appears to have encouraged principals to submit the form earlier. After the follow-up calls, however, the incentive treatment—if anything—seems to have reduced program take-up. One possible explanation is that the lottery may have created the impression that program implementation was voluntary once the deadline had passed.

outcome definitions, including a 16-percentage-point increase in the share of schools that submitted a photo of students participating in the AVE program (column 5).

Next, we investigate whether the treatments affected the timing of the take-up in Figure 1. For this, we examine the date the form and photo were submitted. Most principals sent the material just before the deadline on October 3. Program adoption then starts to flatten out in November, around one month after the initial deadline. The cumulative share of principals who sent the form and photo is very similar between the evidence and control group throughout the entire sample period.

6 Mechanisms

A potential explanation for this null result is that we did not get the attention of the principals, even if they opened the email. However, we also find that the interaction term between the intensity and the evidence treatments is insignificant (Appendix Table A.5). This implies that even after reaching out to the principals and explaining the research findings several times, the principals did not react to this information. Additional evidence against inattention comes from a follow-up experiment in which the same sample of principals was mandated by the government to implement an anti-bullying campaign at their schools. In this experiment, we randomly varied whether principals were informed that their compliance would be monitored. This message varied based on whether the school had implemented the previous AVE campaign.[5] Table 2 shows that the monitoring message was successful in increasing take-up rates, especially for principals who did not previously implement the AVE campaign. These results suggest that principals pay attention to the content of the emails and that the null result of the evidence intervention cannot be explained by principals not reading their emails.

We further exploit the heterogeneity in principal and school characteristics to understand why the evidence treatment did not have a larger effect (Table 3).[6] We start by investigating whether principals already had correct beliefs about the value of the AVE program at baseline. If principals valued the benefits of the AVE program,

[5]The experiment also randomized whether the principals received a motivational message and whether principals received any follow-up calls. Appendix C provides additional details.

[6]We use the dummy variable for whether the principal uploaded a photo of students participating in the AVE program as our main outcome for the heterogeneity analysis. Appendix Table A.6 shows similar results if we use student reports instead.

we would expect that sharing information on the research findings would not lead to an increase in the take-up rate. Columns 1 and 2 show that a large share of principals indeed think that students underestimate the value of education and that the implementation of an information campaign similar to the AVE program would have an effect on test scores. However, we do not find that these beliefs are correlated with program adoption and the interaction terms are also insignificant. In a similar vein, it also might be the case that schools that were part of the treatment group in the AVE pilot program did not have to be convinced of the benefits of the program. Again, we do not find any variation with respect to this attribute.

An alternative explanation is that principals need a certain level of knowledge to value the research findings. We thus investigate whether we find treatment effects for principals with a post-graduate degree. While we see that this subgroup is more likely to adopt the program in general, we do not find that they are more likely to be affected by the evidence treatment. Finally, we examine whether the evidence treatment had no effect because the implementation of the program was mandatory for public schools. However, we also do not find significant effects for private schools or whether principals believe that a penalty for non-compliance is not very likely.

Given that the take-up rate for principals was very high in the treatment group in the initial study, we argue instead that the channel of communication matters. The initial study relied on in-person workshops to encourage principals and policymakers to adopt a new program. A concern with this approach is that these workshops are often expensive to implement and difficult to scale. Our study allows us to examine whether simply sharing research findings by email and calls is sufficient to increase take-up rates. We expect that this would be similar to an approach that many governments would take when scaling up a new program. However, our results suggest that this might not be enough to overcome information frictions.

7 Conclusion

For research to translate into policy impact, researchers and government officials need to find effective approaches to scale-up successful policies. These approaches should not only focus on policymakers but also on government officials who are in charge of implementing the new programs. Our study shows that simply convincing

the policymakers at the Ministry of Education about the benefits of the AVE program was not enough to implement the campaign nationwide. Only around half of the sample had implemented the program at the end of our research study. Creative approaches might thus be necessary to increase take-up rates. We find that a promising approach, sharing research findings with the school principals via email, might not be sufficient to increase policy adoption. Researchers might thus need to think of more creative ways to communicate their research results instead. Finally, our results show that a government call center might be a cost-effective tool to monitor and nudge public officials to implement new policies.

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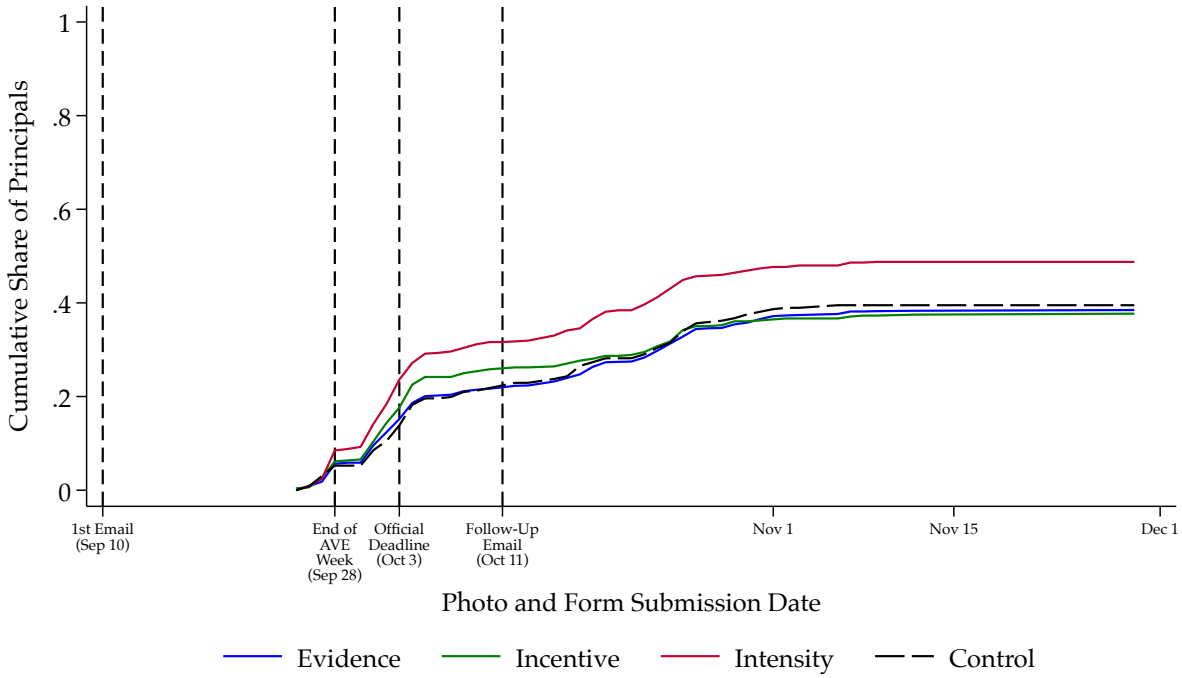
Figure 1: Take-Up Rate Over Time by Treatment



Notes: This figure shows the cumulative share of principals who submitted the form and uploaded a photo of the implementation of the AVE campaign in their school over time. The blue solid corresponds to the evidence treatment, the green dashed line to the incentive treatment, the red dotted line to the intensity treatment, and the black long-dashed line to the control group. The vertical lines show important dates of the implementation timeline.

Table 1: Treatment Effects on AVE Campaign Adoption

	Before Follow-Up Calls			After Follow-Up Calls			
	Downloaded Material (1)	Submitted Photo (2)	Submitted Form (3)	Downloaded Material (4)	Submitted Photo (5)	Submitted Form (6)	Student Reports (7)
Evidence	-0.014	-0.012	-0.031	-0.016	0.005	-0.014	0.023
	[0.019]	[0.019]	[0.018]	[0.018]	[0.019]	[0.019]	[0.026]
Incentive	-0.041	0.009	0.049	-0.062	-0.035	-0.006	-0.025
	[0.024]	[0.024]	[0.023]	[0.024]	[0.025]	[0.024]	[0.032]
Intensity	0.139	0.205	0.134	0.102	0.165	0.119	0.049
	[0.020]	[0.022]	[0.021]	[0.020]	[0.021]	[0.022]	[0.029]
Mean of Control Group	0.608	0.374	0.271	0.661	0.553	0.450	0.531
Observations	2724	2724	2724	2724	2724	2724	1310

Notes: This table shows the treatment effects on different adoption measures of the AVE campaign. We regress each outcome on indicator variables for assignments to the evidence treatment group, the incentive treatment group, the intensity treatment group and the assistance treatment group, stratification dummies, and baseline controls selected by LASSO. Online Appendix Table A.2 shows the list of potential lasso controls. All regressions are estimated by OLS and robust standard errors are reported in parentheses.

Table 2: Treatment Effects on Anti-Bullying Campaign Adoption

	Full Sample			Implemented AVE			Did Not Implement AVE		
	Submitted Photo (1)	Submitted Form (2)	Student Reports (3)	Submitted Photo (4)	Submitted Form (5)	Student Reports (6)	Submitted Photo (7)	Submitted Form (8)	Student Reports (9)
Monitoring	0.045	0.062	0.051	-0.009	0.002	-0.002	0.103	0.127	0.113
	[0.017]	[0.017]	[0.025]	[0.025]	[0.025]	[0.034]	[0.022]	[0.022]	[0.037]
Motivation	-0.011	-0.004	0.003	0.003	0.011	0.009	-0.026	-0.021	-0.004
	[0.017]	[0.017]	[0.025]	[0.025]	[0.025]	[0.033]	[0.022]	[0.022]	[0.037]
Intensity	0.241	0.178	0.134	0.280	0.209	0.134	0.195	0.139	0.131
	[0.017]	[0.018]	[0.026]	[0.026]	[0.026]	[0.035]	[0.023]	[0.023]	[0.039]
Mean of Control Group	0.182	0.215	0.391	0.298	0.337	0.477	0.056	0.080	0.270
Observations	2724	2724	1309	1426	1426	686	1298	1298	623

Notes: This table shows the treatment effects on different adoption measures of the anti-bullying campaign. We regress each outcome on indicator variables for assignments to the motivation treatment group, the monitoring treatment group, and the intensity treatment group, stratification dummies, and baseline controls selected by LASSO. Online Appendix Table C.1 shows the list of potential lasso controls. Columns (1)-(2) show treatment effects for the full sample. The sample is columns (4)-(6) is restricted to schools in which the principal uploaded a photo of the AVE campaign at their school. The sample is columns (7)-(9) is restricted to schools in which the principal did not upload a photo of the AVE campaign at their school. All regressions are estimated by OLS and robust standard errors are reported in parentheses.

Table 3: Heterogeneity Analysis

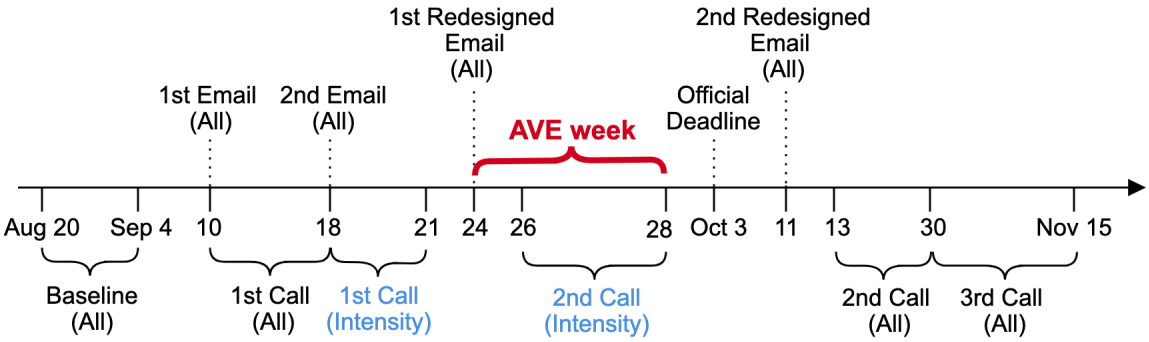
	Outcome: Uploaded Photo					
Heterogeneity Var.:	Info Would Have Effect	Students Undervalue Edu.	Treat. Group in AVE Pilot	Post-Graduate Degree	Public School	Penalty is Very Likely
	(1)	(2)	(3)	(4)	(5)	(6)
Evidence	-0.036	-0.009	-0.000	0.029	0.002	-0.014
	[0.051]	[0.027]	[0.024]	[0.030]	[0.040]	[0.028]
Incentive	0.047	0.011	-0.046	-0.079	-0.097	-0.036
	[0.064]	[0.037]	[0.031]	[0.039]	[0.052]	[0.038]
Intensity	0.095	0.203	0.138	0.131	0.147	0.180
	[0.063]	[0.031]	[0.027]	[0.034]	[0.047]	[0.032]
Evidence × Heterogeneity Var.	0.048	0.023	0.017	-0.035	0.004	0.035
	[0.054]	[0.038]	[0.039]	[0.038]	[0.045]	[0.037]
Incentive × Heterogeneity Var.	-0.097	-0.086	0.027	0.080	0.076	0.000
	[0.070]	[0.050]	[0.053]	[0.052]	[0.059]	[0.050]
Intensity × Heterogeneity Var.	0.081	-0.065	0.086	0.067	0.025	-0.029
	[0.067]	[0.044]	[0.045]	[0.045]	[0.053]	[0.043]
Heterogeneity Var.	-0.034	0.005	0.003	0.083	0.040	0.023
	[0.050]	[0.037]	[0.039]	[0.038]	[0.045]	[0.036]
Mean of Control Group	0.553	0.553	0.553	0.545	0.553	0.553
Mean of Heterogeneity Var.	0.862	0.513	0.323	0.558	0.766	0.553
Observations	2724	2630	2724	2568	2724	2723

Notes: This table shows heterogeneous treatment effects on whether the principal uploaded a photo of the implementation of the AVE campaign in their school. We regress the outcome on indicator variables for assignments to the evidence treatment group, the incentive treatment group, the intensity treatment group, the assistance treatment group, the heterogeneity dummy, interactions between the treatment group variables and the heterogeneity dummy, stratification dummies, and baseline controls selected by LASSO. Online Appendix Table A.2 shows the list of potential lasso controls. All regressions are estimated by OLS and robust standard errors are reported in parentheses.

Online Appendix

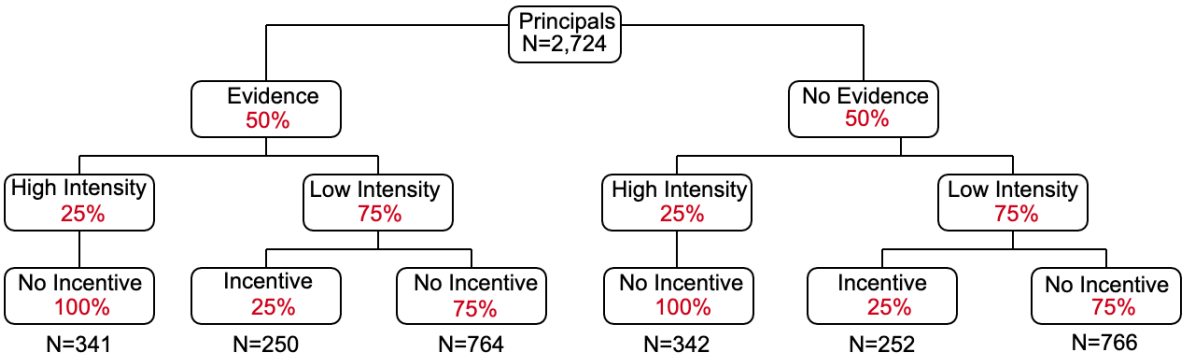
A Implementation Details

Figure A.1: Implementation Timeline



Notes: This figure shows the implementation timeline of the baseline surveys and the experimental interventions.

Figure A.2: Experimental Design



Notes: This figure shows the experimental design. We cross-randomized schools into 6 different treatment arms based on interactions between the "Evidence", "Intensity" and "Incentive" groups

Table A.1: Sample Selection

Sample	Description
7,341	Has no students in grades 7-12 in 2018 ($n = 2,990$)
4,351	Has less than five students in grades 7-12 in 2017 ($n = 162$)
4,189	Did not participated in at least one standardized exam between 2016 and 2018 ($n = 301$)
3,888	No contact details ($n = 7$)
3,881	Randomly select one school to drop if principal supervises more than one ($n = 119$)
3,762	Not reached at baseline ($n = 626$)
3,136	Principal has no access to email ($n = 343$)
2,793	Randomly select one school to drop if principals share the same email address ($n = 16$)
2,777	Did not meet criteria 1-3 in the updated administrative data ($n = 9$)
2,768	Part of pilot survey ($n = 44$)
2,724	Final sample

Notes: This table shows the sample selection criteria. Column (1) shows the remaining number of schools and column (2) describes the selection criteria. Out of 7,341 schools in the Dominican Republic in total, 2,724 schools are included in our final sample.

Table A.2: Balance Check

	Control		Evidence		Incentive		Intensity		
	Mean	St. D.	Coeff.	St. E.	Coeff.	St. E.	Coeff.	St. E.	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: School Characteristics									
Has Internet Connection	0.720	[0.449]	-0.010	(0.017)	-0.014	(0.021)	-0.024	(0.019)	2,717
Has Projector	0.769	[0.422]	-0.003	(0.017)	0.003	(0.021)	0.006	(0.019)	2,719
Has Computer Lab	0.562	[0.496]	-0.004	(0.019)	-0.007	(0.024)	0.020	(0.022)	2,717
Has Electricity	0.987	[0.113]	0.000	(0.005)	0.000	(0.006)	0.004	(0.005)	2,719
Students in 7-12th Grade, 2018	223.887	[234.501]	-14.470	(8.948)	-0.047	(11.652)	-0.725	(9.660)	2,724
Total PN Score 12th Grade, 2018	73.352	[7.269]	0.044	(0.424)	-0.599	(0.449)	-0.859	(0.470)	1,324
Total PN Score 8th Grade, 2016	69.009	[7.363]	0.147	(0.331)	-0.491	(0.392)	-0.107	(0.369)	1,925
Shares Building with Another Sample School	0.100	[0.300]	-0.002	(0.012)	0.016	(0.016)	0.001	(0.013)	2,724
Offers Extended School Day	0.494	[0.500]	-0.022	(0.018)	0.014	(0.022)	-0.004	(0.020)	2,724
Located in Urban Area	0.725	[0.447]	-0.020	(0.017)	0.009	(0.022)	-0.026	(0.019)	2,358
School Is Public	0.763	[0.426]	-0.001	(0.016)	0.010	(0.020)	0.018	(0.018)	2,724
Treatment Group in AVE Pilot	0.307	[0.462]	0.006	(0.019)	0.014	(0.024)	0.011	(0.021)	2,724
Panel B: Principal Characteristics									
Experience of Principal	19.200	[7.664]	-0.644	(0.355)	0.890	(0.457)	0.198	(0.409)	2,111
Principal Has Post-Graduate Degree	0.583	[0.493]	0.003	(0.020)	0.001	(0.026)	-0.030	(0.023)	2,568
Principal Supervises Multiple Schools	0.087	[0.282]	0.012	(0.012)	-0.011	(0.014)	0.009	(0.014)	2,710
Principal Checks Emails Daily	0.593	[0.492]	0.006	(0.020)	-0.039	(0.025)	-0.049	(0.023)	2,630
Believes Penalty after Non-Compliance is Very Likely	0.540	[0.499]	-0.006	(0.020)	0.034	(0.025)	0.005	(0.023)	2,723
Principal's Main Motivation is Professional Success	0.424	[0.495]	-0.003	(0.020)	-0.035	(0.025)	0.023	(0.023)	2,723
Believes Extra Info Would Have An Effect	0.850	[0.358]	-0.015	(0.014)	-0.018	(0.019)	0.018	(0.015)	2,724
Believes Students Undervalue Education	0.499	[0.500]	-0.002	(0.021)	0.039	(0.026)	0.030	(0.024)	2,630
Number of Valid Emails	1.349	[0.679]	0.029	(0.027)	-0.038	(0.033)	-0.013	(0.031)	2,724

Notes: This table shows balance for baseline covariates. Panel A reports on school-level outcomes and Panel B on principal-level outcomes. Differences in sample sizes across variables reflect missing data. Column (1) reports the control group mean of the dependent variable. Columns (3), (5), and (7) report the difference in the dependent variable from OLS regressions of each outcome on indicator variables for assignments to the evidence treatment group, the incentive treatment group, the intensity treatment group and the assistance treatment group, and stratification dummies.

Table A.3: Differences in Number of Emails Sent and Opened by Treatment

	1st Email		2nd Email		1st Redesigned Email		2nd Redesigned Email	
	Sent (1)	Opened (2)	Sent (3)	Opened (4)	Sent (5)	Opened (6)	Sent (7)	Opened (8)
Evidence	-0.001	0.024	-0.001	0.032	-0.003	0.027	-0.006	0.002
	[0.006]	[0.016]	[0.006]	[0.018]	[0.006]	[0.018]	[0.007]	[0.022]
Incentive	-0.007	-0.016	-0.007	0.003	-0.008	-0.044	-0.008	-0.037
	[0.008]	[0.021]	[0.008]	[0.023]	[0.008]	[0.023]	[0.010]	[0.028]
Intensity	-0.016	0.007	-0.016	0.060	-0.001	0.006	-0.006	0.035
	[0.007]	[0.018]	[0.007]	[0.019]	[0.006]	[0.020]	[0.008]	[0.025]
Sample	Full	Full	Full	Full	Full	Full	Non-Adopters	Non-Adopters
Mean of Control Group	0.982	0.750	0.982	0.687	0.982	0.692	0.976	0.616
Observations	2724	2724	2724	2724	2724	2724	2021	2021

Notes: This table shows differences in the emails sent and opened by treatment arm. We regress each outcome on indicator variables for assignments to the evidence treatment group, the incentive treatment group, the intensity treatment group and the assistance treatment group, stratification dummies, and baseline controls selected by LASSO. Online Appendix Table A.2 shows the list of potential lasso controls. All regressions are estimated by OLS and robust standard errors are reported in parentheses.

Table A.4: Differences in Number of Calls Received by Treatment

	1st Call (1)	2nd Call (2)	3rd Call (3)	4th Call (4)	5th Call (5)
Evidence	-0.023	0.001	-0.012	-0.022	-0.043
	[0.011]	[0.006]	[0.007]	[0.010]	[0.023]
Incentive	-0.017	0.003	0.004	-0.023	0.057
	[0.016]	[0.002]	[0.002]	[0.013]	[0.027]
Intensity	0.006	0.927	0.863	-0.034	-0.162
	[0.013]	[0.012]	[0.016]	[0.013]	[0.027]
Sample	Full	Full	Full	Non-Adopters	Non-Adopters
Mean of Control Group	0.948	0.000	0.000	0.952	0.626
Observations	2021	2021	2021	2021	2021

Notes: This table shows differences in calls received by treatment arm. We regress each outcome on indicator variables for assignments to the evidence treatment group, the incentive treatment group, the intensity treatment group and the assistance treatment group, stratification dummies, and baseline controls selected by LASSO. Online Appendix Table A.2 shows the list of potential lasso controls. All regressions are estimated by OLS and robust standard errors are reported in parentheses.

Table A.5: Treatment Effects on AVE Campaign Adoption With Interaction Between Evidence and Intensity Treatments

	Before Follow-Up Calls			After Follow-Up Calls			
	Downloaded Material (1)	Submitted Photo (2)	Submitted Form (3)	Downloaded Material (4)	Submitted Photo (5)	Submitted Form (6)	Student Reports (7)
Evidence	-0.021	-0.026	-0.033	-0.018	0.001	-0.019	0.031
	[0.022]	[0.022]	[0.020]	[0.021]	[0.022]	[0.022]	[0.030]
Incentive	-0.041	0.009	0.049	-0.062	-0.035	-0.006	-0.025
	[0.024]	[0.024]	[0.023]	[0.024]	[0.025]	[0.024]	[0.032]
Intensity	0.157	0.175	0.134	0.129	0.167	0.126	0.080
	[0.033]	[0.037]	[0.036]	[0.032]	[0.035]	[0.037]	[0.052]
Intensity × Evidence	0.027	0.054	0.008	0.007	0.017	0.020	-0.030
	[0.039]	[0.042]	[0.041]	[0.038]	[0.040]	[0.042]	[0.056]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Full	Full	Full	Full	Full	Full	Full
Mean of Control Group	0.608	0.374	0.271	0.661	0.553	0.450	0.531
Observations	2724	2724	2724	2724	2724	2724	1310

Notes: This table shows the treatment effects on different adoption measures of the AVE campaign. We regress each outcome on indicator variables for assignments to the evidence treatment group, the incentive treatment group, the intensity treatment group and the assistance treatment group, an interaction between the evidence and intensity treatment group dummies, stratification dummies, and baseline controls selected by LASSO. Online Appendix Table A.2 shows the list of potential lasso controls. All regressions are estimated by OLS and robust standard errors are reported in parentheses.

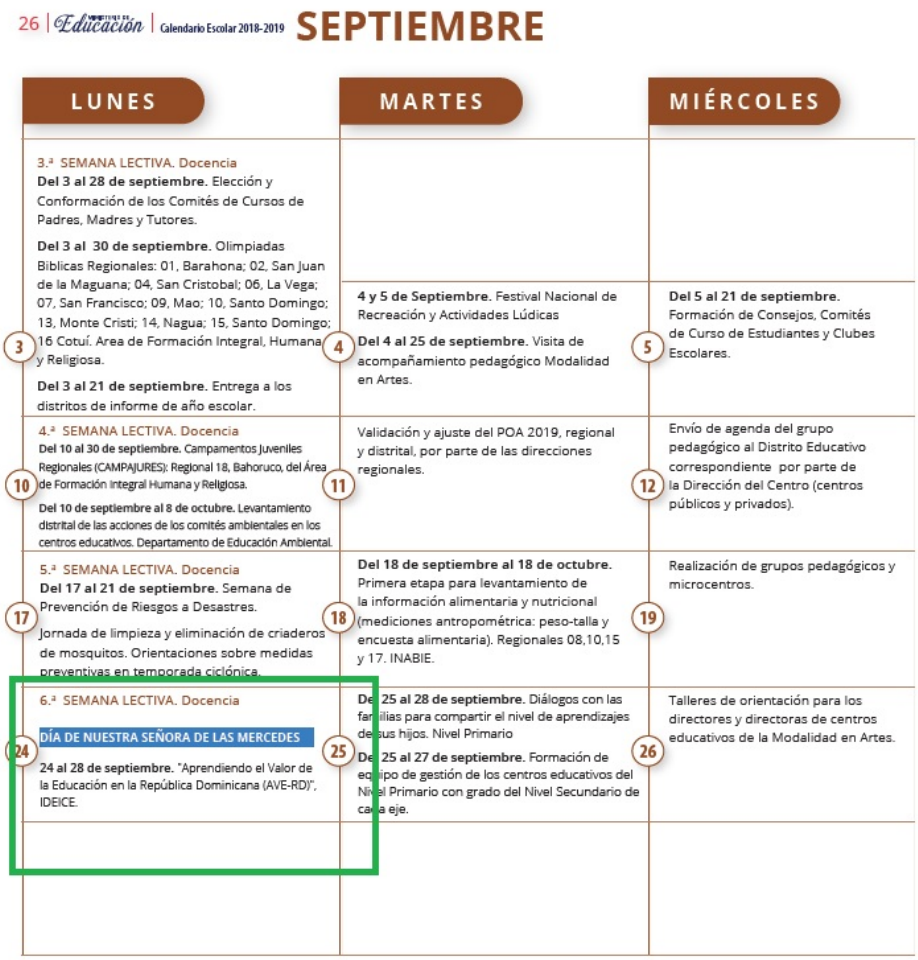
Table A.6: Heterogeneity Analysis Using Student Reports as Outcome

	Outcome: Student Reports					
Heterogeneity Var.:	Info Would Have Effect	Students Undervalue Edu.	Treat. Group in AVE Pilot	Post-Graduate Degree	Public School	Penalty is Very Likely
	(1)	(2)	(3)	(4)	(5)	(6)
Evidence	0.000	0.011	0.040	0.015	0.046	-0.020
	[0.068]	[0.036]	[0.030]	[0.042]	[0.042]	[0.037]
Incentive	0.069	-0.050	-0.029	-0.026	-0.104	0.008
	[0.089]	[0.045]	[0.036]	[0.054]	[0.048]	[0.046]
Intensity	-0.045	0.100	0.039	0.080	0.048	0.050
	[0.081]	[0.041]	[0.034]	[0.051]	[0.052]	[0.042]
Evidence × Heterogeneity Var.	0.027	0.014	-0.074	0.000	-0.043	0.084
	[0.073]	[0.051]	[0.060]	[0.054]	[0.052]	[0.050]
Incentive × Heterogeneity Var.	-0.110	0.059	0.029	0.026	0.125	-0.058
	[0.095]	[0.066]	[0.076]	[0.069]	[0.063]	[0.065]
Intensity × Heterogeneity Var.	0.109	-0.075	0.046	-0.033	-0.005	0.003
	[0.088]	[0.061]	[0.067]	[0.064]	[0.063]	[0.059]
Heterogeneity Var.	0.019	0.011	0.087	0.014	0.344	0.045
	[0.063]	[0.052]	[0.061]	[0.053]	[0.057]	[0.049]
Mean of Control Group	0.531	0.532	0.531	0.554	0.531	0.531
Mean of Heterogeneity Var.	0.862	0.513	0.323	0.558	0.766	0.553
Observations	1310	1264	1310	1208	1310	1310

Notes: This table shows heterogeneous treatment effects on whether the school adopted the AVE campaign according to student reports, defined as having at least 50% of students in a school report in the 12th-grade national exam that either they or other students at their school participated in the AVE campaign in the 2018-2019 academic year. We regress the outcome on indicator variables for assignments to the evidence treatment group, the incentive treatment group, and the intensity treatment group, the heterogeneity dummy, interactions between the treatment group variables and the heterogeneity dummy, stratification dummies, and baseline controls selected by LASSO. Online Appendix Table A.2 shows the list of potential lasso controls. All regressions are estimated by OLS and robust standard errors are reported in parentheses.

B Additional Material for AVE Campaign

Figure B.1: Official Academic Calendar



Notes: This figure shows the official academic calendar for the 2018-2019 school year in the Dominican Republic. The calendar states that the AVE campaign should be implemented between September 24 and 28.

Figure B.2: Intervention Brochure for Control Group

Notes: This figure shows the brochure that was attached to the first email for the control group.

Figure B.3: Intervention Brochure for Evidence Treatment Group

Notes: This figure shows the brochure that was attached to the first email for the evidence group.

C Additional Results for Anti-Bullying Campaign

Here is the content of the messages we randomized in the follow-up experiment:

- Motivation
  - All principals: *The school climate is an important factor that promotes learning. The school climate is something that can be managed, and the "Declaration for Peace" can contribute to this end. Be part of the solution and let's help together to reduce bullying and bad treatment at school.*
- Monitoring
  - For principals who implemented the AVE campaign: *According to our records, your school successfully implemented the Learning the Value of Education campaign (AVE-RD). We thank you for your participation, and we urge you to also participate in the "Declaration for Peace". Again we will be monitoring compliance with this instruction, to ensure that this campaign is implemented properly.*
  - For principals who did not implement the AVE campaign: *According to our records, your school did not satisfactorily implement the previous campaign Learning the Value of Education (AVE-RD). We urge you to participate in the "Declaration for Peace" on this occasion. Again we will be monitoring compliance with this instruction, to ensure that this campaign is implemented properly.*

A third intervention arm received a high-intensity treatment. While other principals were only contacted via email, the high-intensity treatment group received two additional reminders from a call center. All three intervention arms were perfectly cross-randomized.

Table C.1: Balance Check

	Control		Motivation		Monitoring		Intensity		
	Mean	St. D.	Coeff.	St. E.	Coeff.	St. E.	Coeff.	St. E.	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: School Characteristics									
Has Internet Connection	0.738	[0.440]	-0.004	(0.017)	0.013	(0.017)	0.000	(0.017)	2,717
Has Projector	0.753	[0.432]	0.014	(0.016)	-0.001	(0.016)	-0.007	(0.016)	2,719
Has Computer Lab	0.558	[0.497]	0.008	(0.019)	-0.005	(0.019)	0.014	(0.019)	2,717
Has Electricity	0.994	[0.077]	-0.007	(0.004)	0.006	(0.004)	-0.006	(0.004)	2,719
Students in 7-12th Grade, 2018	188.632	[186.571]	-8.408	(8.458)	8.693	(8.472)	-7.335	(8.466)	2,724
Total PN Score 12th Grade, 2018	72.931	[7.263]	0.722	(0.396)	-0.502	(0.393)	0.340	(0.396)	1,324
Total PN Score 8th Grade, 2016	69.418	[7.422]	-0.105	(0.337)	-0.098	(0.336)	0.183	(0.335)	1,925
Shares Building with Another Sample School	0.079	[0.271]	0.012	(0.011)	0.005	(0.011)	0.002	(0.011)	2,724
Offers Extended School Day	0.409	[0.492]	0.012	(0.019)	0.026	(0.019)	0.015	(0.019)	2,724
Located in Urban Area	0.737	[0.441]	-0.018	(0.019)	-0.013	(0.019)	-0.008	(0.019)	2,358
School Is Public	0.732	[0.443]	0.012	(0.016)	-0.013	(0.016)	-0.003	(0.016)	2,724
Treatment Group in AVE Pilot	0.332	[0.472]	0.026	(0.018)	-0.022	(0.018)	-0.014	(0.018)	2,724
Panel B: Principal Characteristics									
Experience of Principal	19.183	[8.045]	0.295	(0.333)	0.063	(0.334)	-0.471	(0.334)	2,111
Principal Has Post-Graduate Degree	0.550	[0.498]	-0.019	(0.020)	-0.017	(0.020)	-0.010	(0.020)	2,568
Principal Supervises Multiple Schools	0.083	[0.276]	-0.007	(0.011)	0.007	(0.011)	0.011	(0.011)	2,710
Principal Checks Emails Daily	0.592	[0.492]	0.023	(0.019)	-0.016	(0.019)	0.005	(0.019)	2,630
Believes Penalty after Non-Compliance is Very Likely	0.560	[0.497]	-0.002	(0.019)	0.028	(0.019)	0.003	(0.019)	2,723
Principal's Main Motivation is Professional Success	0.447	[0.498]	-0.007	(0.019)	0.022	(0.019)	-0.011	(0.019)	2,723
Believes Extra Info Would Have An Effect	0.868	[0.339]	-0.012	(0.013)	-0.010	(0.013)	0.013	(0.013)	2,724
Believes Students Undervalue Education	0.531	[0.500]	-0.023	(0.019)	-0.023	(0.019)	0.019	(0.019)	2,630
Number of Valid Emails	1.347	[0.698]	-0.004	(0.026)	-0.025	(0.026)	0.039	(0.026)	2,724

Notes: This table shows balance for baseline covariates. Panel A reports on school-level outcomes and Panel B on principal-level outcomes. Differences in sample sizes across variables reflect missing data. Column (1) reports the control group mean of the dependent variable. Columns (3), (5), and (7) report the difference in the dependent variable from OLS regressions of each outcome on indicator variables for assignments to the motivation treatment group, the monitoring treatment group, and the intensity treatment group, and stratification dummies.