Expanding Educational Opportunities in

Remote Parts of the World:

Evidence from a RCT of a Public-Private Partnership in Pakistan[1]

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Abstract:
We evaluate the effects of publicly funded private primary schools on child enrollment in a sample of 263 villages in 10 underserved districts of rural Sindh province, Pakistan. The program is found to significantly increase child enrollment and reduce existing gender disparities. Enrollment increases by 51 percentage points in treated villages; while girls show an increase 4-5 percentage points greater than boys. The gender gap is found to arise primarily in areas that have access to a government school; and this gap is eliminated by the introduction of a PPRS school. The introduction of PPRS schools crowds out enrollment in both public and private schools, with the impact being greater for public schools. We find no evidence that providing greater financial incentives to entrepreneurs for the recruitment of girls leads to a greater increase in female enrollment than does an equal compensation scheme for boys and girls.

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I. Introduction and Literature Review

The promotion of universal primary education has received increased impetus in recent years, as reflected in such initiatives as the Millennium Development Goals and the Education for All movement. Although considerable progress has been made in raising primary education levels, more than 69 million primary-aged children remain outside the education system, most of whom live in developing countries. Finding viable strategies for improving educational attainment is of paramount importance to donors and policy-makers. Our research explores the feasibility of low-cost public-private partnerships for extending educational opportunity to marginal, underserved communities in countries facing considerable political, logistical, and resource constraints.

A central challenge in the drive for universal enrolment is the inequality in educational opportunity between boys and girls. It is estimated that women constitute two-thirds of the world's illiterate adults and 54% of un-enrolled school-aged children (UNESCO, 2010). There is a strong regional component to this gender disparity: Sub-Saharan Africa and Western and South Asia are characterized by particularly high levels of educational gender inequality (Hausmann, *et al.*, 2009). A separate but related issue is the rural-urban divide in educational opportunity: within developing countries, enrollment rates in rural areas tend to lag those in urban locations (UN, 2008a). Moreover, the gender disparity in enrollment is primarily driven by inequalities in rural areas (UN, 2008b).

The intervention we evaluate entailed the provision of schools through public-private partnerships to 200 villages randomly chosen from a sample of 263 qualifying locales. Private entrepreneurs were given the responsibility of establishing and running primary schools, to which all children between the ages of 5 and 9 were eligible for free enrollment, with the entrepreneurs given a per-child subsidy by the Sindh provincial government. In addition, in half of the 200 treatment villages the subsidy scheme was structured such that entrepreneurs received a higher subsidy for girls than boys. [2] The introduction of PPRS schools leads to large gains in enrollment; overall, enrollment increases by 51 percentage points in villages receiving PPRS schools compared to those that don't. The effect is slightly larger for girls than boys, with boys showing an enrollment increase 4-5 percentage points lower. However, the differential subsidy shows no greater effectiveness in inducing female enrollment than the equal subsidy; though the reason for this "failure" seems to be that the equal subsidy has proven so effective that there is little margin left for inducing greater enrollment through a higher subsidy for females.

This research relates to a broad literature examining the determinants of educational enrollment and the effects of policy interventions in promoting enrollment in developing countries. Among those interventions addressing supply constraints on educational enrollment, school quality has been shown to be of uncertain importance. For example, in surveys of the literature on education in developing countries, Glewwe and Kremer (2006) and Kremer and Holla (2008) find mixed evidence for the effectiveness of school quality in increasing enrollment. Glewwe, *et al.* (2002) find that the provision of free textbooks has no effect on school enrollment. Banerjee, *et al.* (2000), however, find that providing additional female teachers raised girls' participation in non-formal educational settings by 50%.

In contrast to the uncertain effectiveness of quality-based interventions, conditional cash transfers and reductions of user-fees have proven highly effective in

[2] Because some of the areas were later deemed urban, our sample was reduced to 162 treatment localities and 38 control. Of the 162 treatment localities, 83 had the equal subsidy intervention and 79 the differential subsidy.

increasing enrollment rates. Schultz (2004) evaluates the effectiveness of the pioneering conditional cash transfer program, PROGRESA, and finds a significant effect in promoting enrollment and attendance. These results have been replicated in studies of similar programs in other countries (Cardoso and Souza, 2004; Levy and Ohls, 2006; Barrera-Osorio, *et al.*, 2008; Filmer and Schady, 2008). User-fee reductions have also been effective in increasing enrollment (Barrera-Osorio, *et al.*, 2007; Borkum, 2009).

Similarly, in developing country contexts, where much of the population lives in rural locations with few public services, school proximity is a particularly important determinant of enrollment. Duflo (2000) investigates the effects a large school expansion effort in areas of Indonesia with low initial enrollment rates, and finds that the construction of these schools had a positive effect on school enrollment: each school built for every 1000 children led to an additional 0.12 to 0.19 years of schooling. Burde and Linden (2010) also find positive effects of the presence of community-based schools in Afghanistan, with villages receiving schools showing a 42 percentage point increase in enrollment, reflecting a strong negative correlation of school distance and enrollment, whereby each additional mile results in a 19 percentage point decrease in enrollment. These results are particularly pronounced for females, with the consequence that in treatment villages the enrollment gap between boys and girls is almost eliminated, falling from 21% to 5%. Levy, *et al.* (2009) evaluate the enrollment effects of the BRIGHT program in Burkina Faso, which consisted of constructing 132 primary schools and implementing a set of complementary interventions designed to increase girls' enrollment rates in villages where initial female enrollment was low. School enrollment increased by 17.6 percentage points for boys and 22.2 percentage points for girls.

While gender disparities in education have often been thought to be driven by household demand, the high elasticity of female enrollment to supply-side educational interventions is suggestive of the importance of cost constraints (Glewwe and Kremer, 2006; Burde and Linden, 2010). For example, with girls playing a larger role in domestic work than boys, the opportunity cost of female enrollment is higher than that of males, potentially contributing to educational disparities. Consistent with this, Glick and Sahn (2000) find that domestic responsibilities, represented by the number of very young siblings, have a strongly adverse effect on girls' enrollment but not on boys'. Similarly, Pitt and Rosenzweig (1990) find that daughters are more likely to increase their time in household work relative to school than their brothers in response to a younger sibling's illness. As described above, the distance to school also appears to be a more significant deterrent to girls' enrollment than boys' (Alderman, *et al.*, 2001; Lloyd, *et al.*, 2005; Burde and Linden 2010). Females may be deemed more at risk of physical harm than males, thereby posing either a psychological cost for parents of allowing their daughters to walk long distances, or a pecuniary cost if this induces parents to pay for transportation.

II. Pakistan and the PPRS Program

A. Education in Pakistan

School participation is low in Pakistan, even when taking into account that country's level of economic development (Andrabi, *et al*., 2008). Nationwide, the primary school net enrollment rate for children ages 5-9 is 56%: 60% for males and 51% for females. These national averages subsume large regional disparities: in the poorer, more rural provinces, net enrollment rates are lower for both sexes, and gender disparities are often higher. In the rural areas of Sindh province, for example, where our program was implemented, only 49% of males and 31% of females between the ages of 5 and 9 are enrolled in primary school (PSLM 2007).

In the last two decades, Pakistan has witnessed an exponential growth in for-profit private schools. Once the preserve of the elite, private schools are increasingly serving disadvantaged populations, whether in poor urban neighborhoods or remote rural villages. These schools have succeeded along dimensions of both cost and quality: at an average $18 per year in villages, the cost represents a small fraction of household income (Andrabi, et al., 2008); while student achievement levels have been better than in government schools, even controlling for village and household characteristics (Das, et al. 2006). The cost-effectiveness of these schools is attributable largely to their ability to recruit local women as teachers, to whom significantly lower wages can be paid due to the scarcity of alternative employment options in rural areas.

B. PPRS Description

The intervention evaulated here was implemented by the Sindh Education Foundation (SEF), a quasi-governmental agency of the Sindh provincial government. SEF was established in 1992 as a semi-autonomous organization to undertake education initiatives in less-developed areas and for marginalized populations within Sindh province, and granted license to adopt non-conventional strategies in pursuit of this objective.[3] The "Promoting Low-Cost Private Schooling in Rural Sindh" (PPRS) program, evaluated in this paper, is notable example of this innovative approach to extending educational access. Leveraging the advantages of private education described above, the program seeks to expand education access in underserved rural communities through public-private partnerships with local entrepreneurs. Private entrepreneurs who become program

[3] The SEF has pioneered a number of innovative education programs, some of which have been replicated elsewhere in Pakistan. Key programs in its portfolio include the Adopt-a-School Program, which enables the private management of "sick" public schools; the Support to Private Education Institutes Program, which provides institutional, technical, and human resource development assistance to low-cost private schools; and the Community Supported Schools Program and Fellowship Schools Program, which supports local communities in establishing and managing small schools.

participants are granted a per-student cash subsidy to operate coeducational primary schools, as well as additional, non-monetary assistance to improve the quality of the education provided. Enrollment is tuition-free and open to all children in the village between the ages of 5 and 9, with the entrepreneur receiving an enrollment-based subsidy from the SEF. By giving to local private entrepreneurs responsibility for operating these schools, coupled with appropriate incentives and oversight from the government, the PPRS program seeks to take advantage of the local knowledge and underutilized resources within these communities to provide viable, appropriate, and affordable education in these remote, and previously neglected, areas.

Two types of subsidy schemes were introduced in order to explore strategies for increasing overall enrollment and reducing the gender-gap. The first, which we term the "equal subsidy" scheme, consists of a monthly subsidy of 350 rupees (USD 4.7) being provided to the entrepreneur for each child enrolled in his or her school. The second, termed the "differential subsidy" scheme, consists of a gender-differentiated subsidy in which the entrepreneur receives the same 350 Rupees for each male student enrolled and 450 rupees for each female. It is hoped that the structure of the subsidy, a function of the number of children enrolled, introduces a strong incentive for the school operator to undertake investments and actions to attract children to school. In addition, offering a higher subsidy for girls relative to boys in a subset of schools introduces a stronger incentive for the school operator to draw in girls by undertaking investments and actions that are attractive to the parents of girls, such as hiring female teachers, providing safe transportation and a safe schooling environment, or even offering small stipends to girls.

The program was first implemented on a pilot basis in 10 districts of the province. These districts were chosen to participate in this program due to their being the most deprived in terms of educational resources: based on rankings determined by several indicators of education deprivation – including the size of the out-of-school child population, the initial gender disparities in school participation, and the share of households at least 15 minutes away from the nearest primary school – the 10 lowest ranked districts were selected for participation. Interested entrepreneurs were asked to apply to for the program by submitting proposals to set up and operate primary schools in rural communities within these districts. These proposals were vetted according to several criteria: they could have no primary school within a 1.5 kilometer radius of the proposed school site; the applicant needed the written consent of the parents of at least 75 children who would attend the school once set up; and the applicant was required to have identified a sufficient number of qualified teachers and an adequate facility in which to hold classes. A total of 263 localities were deemed eligible, from which 200 were randomly selected to receive treatment (100 within each treatment group) and 63 were kept as control localities to understand what happened without support.

Program assignment followed an oversubscription experimental design. Applications from 263 distinct communities were identified as having met the criteria for selection, based upon both local need and the entrepreneur's having secured an adequate facility and qualified teaching staff. Of these, 200 communities were randomly selected to receive program benefits for establishing and running PPRS schools, and the remaining 63 communities were assigned to control status. These 200 treatment localities were in turn randomly divided into two equal sized groups of 100, one receiving the "equal subsidy" intervention and the other the "differential subsidy".

III. Methodology

In order to identify the causal impact of the intervention, the qualifying localities were randomly assigned to the control and two treatment groups, thereby ensuring that receipt of a school is uncorrelated with village characteristics that may influence the efficacy of the program. Insofar as randomization has established statistically indistinguishable groups across the control and treatment villages, any differences between them can be attributed to the intervention.

A. Research Design

The participating villages were chosen according both to their need as well as the ability of the entrepreneur to secure an adequate facility for conducting classes and qualifying teachers to lead them.[4] In total, 263 villages across 10 districts of Sindh Province qualified to participate in the PPRS program. Of these, 100 were randomly assigned to each of the two treatment groups, and the remaining 63 to the control. In villages assigned to the equal subsidy treatment (treatment 1), the private entrepreneurs were given an identical 350 rupees payment for each child enrolled in the school, regardless of gender. In the differential subsidy treatment (treatment 2), entrepreneurs were given an additional 100 rupees for each female enrolled.

A baseline survey was conducted in all qualifying villages in February, 2009. Following the survey, the villages were randomly assigned to the two treatments and one control group. The schools were then established in the summer of 2009. Because the new school term normally commences in the spring, the students received an abbreviated term in their first year. In anticipation of conducting the follow-up survey, a census was

[4] In practice, this meant establishing that there was no primary school within 1.5 kilometers of the proposed site, that the building possessed at least two rooms greater than 200 square feet each, and x teachers possessing at least an 8th grade education.

conducted of treatment and control villages[5] in June 2010. Due to the disruptions caused by the widespread flooding that occurred in late summer 2010, the follow-up survey, originally scheduled to commence immediately after the census, was postponed until April, 2011.

B. Data

In both the baseline survey and the census, socio-demographic information was collected. The content of these two surveys was slightly different, however. While they both included questions on the age, gender, and enrollment status of all children ages 5-9 in the household, the census also collected information about children ages 10-15. In addition, the baseline survey gathered on the education and occupation of the *primary wage earner*, whereas in the census this information was gathered for the *head of household*. While in practice these individuals will almost always be identical, there will be exceptions that render these variables not exactly comparable. The census also included more socio-demographic questions than the baseline, including the caste of the head of household, the amount of irrigated land owned by the household, and the building material of the house.

The follow-up survey will include numeric and literacy tests for all children between the ages of 5 and 10 in a randomly chosen sample of households from each village. In addition, reported enrollment will be verified through school surveys. This will allow us to establish the effectiveness of the intervention in increasing enrollment and test scores. However, because information was collected on the age, gender, and self-reported enrollment status of each child in the baseline and census, it is possible to

[5] Localities determined to have a population density more indicative of an urban than rural locale were excluded from the census.

conduct a preliminary assessment of the effectiveness of the program in promoting school enrollment, as reported by respondents.

C. Statistical Models

We employ seven models to assess the effectiveness of the program. Our simplest specification aggregates the two treatment groups:

$$Y_i = \alpha + \beta T_i + \varepsilon_i \tag{1}$$

where Y_i is the outcome of interest for child *i*, and T_i is a dummy variable indicating whether child *i* lives in a village assigned a PPRS school.

To determine whether there is a differential effect across the equal and differential subsidy treatments, we next estimate a model in which we disaggregate the two:

$$Y_i = \alpha + \beta_1 T_{1i} + \beta_2 T_{2i} + \varepsilon_i \tag{2}$$

where T_{1i} and T_{2i} are dummies indicating the equal and differential treatments respectively.

Because females have a lower enrollment rate, and one of the treatments has been specifically designed to encourage higher female participation, we also estimate a model disaggregating the effect of the program by gender:

$$Y_i = \alpha + \beta_1 T_i + \beta_2 M_i + \beta_3 (T_{1i} \times M_i) + \varepsilon_i \tag{3}$$

where M_i is a dummy equaling 1 if child *i* is male.

To test directly whether the differential subsidy induces a higher female up-take than does the equal subsidy, we estimate a model disaggregating across the two treatments and gender:

$$Y_i = \alpha + \beta_1 T_{1i} + \beta_2 T_{2i} + \beta_3 M_i + B_4 (T_{1i} \times M_i) + \beta_5 (T_{2i} \times M_i) + \varepsilon_i \tag{4}$$

To explore the relationship of PPRS enrollment to the availability of public and private schools, we estimate the following equation:

$$Y_i = \alpha + \beta_1 T_i + \beta_2 G_i + \beta_3 P_i + \beta_4 (T_i \times G_i) + \beta_5 (T_i \times P_i) + \varepsilon_i$$

(5)

where G_i and P_i indicate the presence of a government school and private school, respectively, being located in the vicinity of the village. We also estimate this regression including a full set of gender interactions,

$$\begin{aligned} Y_i &= \alpha + \beta_1 T_i + \beta_2 G_i + \beta_3 P_i + \beta_4 (T_i \times G_i) + \beta_5 (T_i \times P_i) + \beta_6 M_i + \\ &M_i(\beta_7 T_i + \beta_8 G_i + \beta_9 P_i + \beta_{10} (T_i \times G_i) + \beta_{11} (T_i \times P_i)) + \varepsilon_i \end{aligned} \quad (6)$$

in order to determine the differential effects across genders.

Finally, we test the internal validity of our results by testing for differential attrition across the treatment and control groups:

$$Y_i = \alpha + \beta_1 T_i + \beta_2 Attrit_i + \beta_3 (T_i \times Attrit_i) + \varepsilon_i \quad (7)$$

where T_i is again the pooled treatment, $Attrit_i$ is a dummy indicating whether the child or household has attrited from the sample, and Y_i is some characteristic of the child or household.

IV. Internal Validity

A. Correlates of Enrollment

We first identify the socio-demographic correlates of enrollment. This will allow us to assess the importance of any imbalances that might exist in our sample across control and treatment groups. We perform this analysis using two distinct data sets. The first is the baseline data set, which was collected prior to the randomization and allotment of schools, and includes all villages in our sample. The second is the data collected during the census, which was conducted nearly a year after the opening of the schools. For this analysis, we include only control villages from the census.

Column (7) in Table 3 displays the results of a regression of child enrollment on child and household characteristics using our baseline data set. Males are 9.1 percentage points more likely to be enrolled in school than females, while the likelihood of being enrolled increases by 3.3 percentage points with age. Children in households with an additional member are 1.3 percentage point more likely to be enrolled, while each additional child is correlated with a 2.5 percentage point lower likelihood of enrollment. An additional year of education for the primary wage earner is correlated with a 1.7 percentage point increase in the likelihood a child is enrolled. All of these are statistically significant at the 1 percent level. Among occupations, the primary wage earner's being a daily laborer reduces the likelihood of the child being enrolled by 6.6 percentage points against the baseline "other," and being a farmer by 4.5 percentage points, though neither of these is statistically significant.

Column (7) in Table 2 displays the results of a similar regression using the census and including only the control localities. Again, males are more likely to be enrolled than females, though here only by 6.8 percentage points; and each year of child age is correlated with a 3.0 percentage point increase in the likelihood of being enrolled. Both are statistically significant at the 1 percent level. Larger households are correlated with a 1.0 percentage point increase in the probability of enrollment; while additional children are correlated with a 2.8 percentage point lower likelihood of enrollment. An extra year of education for the head of household is associated with a 1.1 percentage point increase in the likelihood of being enrolled. All three are statistically significant at the 10 percent level. Land holdings show only a small and statistically insignificant correlation with enrollment. The building material of the house being other than "semi-pukka"[6] leads to a

[6] "Pukka" means brick; and "pukka" houses are made of brick or concrete, and are indicative of greater affluence. "Kaccha", in contrast, refers to non-brick accommodations, usually built of

decline in the probability of enrollment of 18.3-36.3 percentage points. Being a farmer is associated with a 14.5 percentage point decline in the probability of being enrolled against the baseline "other," while being a laborer is associated with a 7.5 percentage point decline (though it should be noted that the classification scheme of the occupation variable is different than in the baseline survey). Interestingly, being a landlord is associated with a 17.4 percentage point decline in the likelihood of being enrolled. These results likely are indicative of a generally lower enrollment rate for classes from the agricultural sector of the economy compared to the non-agricultural sector.

The validity of our results depends upon the comparability of populations across treatment and control groups. Because the villages were randomly selected, treatment should be orthogonal to household and child characteristics that might be correlated with the outcomes of interest. Insofar as this holds, it will be sufficient to compare outcomes across groups to evaluate the effect of the intervention. To assess the comparability of villages, we use the fore-mentioned baseline and census data.[7]

B. Census Balance

Table 2 shows statistics on household characteristics collected during a complete census of all the qualifying villages in our sample. These include variables on the age and gender of the child; number of household members, as well as children between the ages of 5

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traditional mud and straw materials, indicative of economic underdevelopment. "Semi-pukka" houses are those made of a combination of these materials.

[7] The method by which the baseline data was gathered requires brief discussion. The approach adopted was the "spin-the-bottle" technique, whereby 12 households were chosen based on their being along a straight line determined by a bottle spun in the center of the village. Though this is the approach adopted by many development organizations, it falls short of representing a truly randomly drawn sample, and as such the results must be used with caution. However, insofar as the technique was employed consistently across treatment groups, the populations should still be roughly balanced if the randomization has been successful. See Appendix for a discussion of the baseline and its comparability with the census, as well as Table A1 for relevant statistics.

and 15; the education level and occupation of the household head; and the building material of the house.[8] Columns (1)-(3) give the means of the child, household, and occupational characteristics across the control and two treatment groups; columns (4)-(6) give the differences in means. The villages are largely balanced, though children in control villages are 2.7 and 3.8 percentage point more likely to be male than in treatment 1 and treatment 2[9] villages respectively, significant at the 5% and 1% levels. In addition, treatment 2 villages have 0.624 fewer members per household than control villages and 0.612 fewer members than treatment 1 villages, the former being insignificant and the latter significant at the 10% level.

C. Baseline Balance and Attrition

The census, however, was conducted nearly a year after the introduction of the schools, and it is therefore possible that differential attrition rates have yielded populations that differ along relevant, but unobservable, dimensions. For example, if households that value education more highly have moved to treatment villages, then our results would be biased upwards, as the populations of treatment villages would be more likely to enroll their children in school than those of control villages. To address this possibility, we compare household and child characteristics using our baseline survey; and then use this data to conduct attrition analysis to ensure that there has not been differential attrition across the control and treatment groups.

Table 3 displays statistics from the baseline for various child and household characteristics across the control and two treatment groups. These variables include child enrollment, gender, and age, as well as the size of the household, number of children, and

[8] See Appendix Table A3 for a fuller comparison of occupational categories.

[9] The "treatment 1" villages are those receiving the assigned equal subsidy scheme, while the "treatment 2" villages are those assigned the differential subsidy scheme.

the education and occupation of the primary wage earner.[10] Columns (1)-(3) give the means of the respective variables across the three groups, while columns (4)-(6) show the difference in means. Enrollment in treatment 1 villages is 5.4 percentage points higher than in control villages and 5.6 percentage points higher than in treatment 2 villages, though this difference is not statistically significant. Households in treatment 2 villages have 0.660 fewer members than in control villages, and 0.759 fewer than in treatment 1 villages, significant at the 10% and 1% levels respectively. Other than these two variables, the treatment and control groups are generally balanced.

Table 4 displays household characteristics across treatment and control groups disaggregated by attrition. Columns (3) and (6) show the differential attrition rates for these variables within control and treatment groups. Household and child characteristics are fairly balanced across the attrited and non-attrited groups. Within control villages, enrollment is 9.5 percentage points higher among non-attrited children than attrited, though this is not statistically significant. The household head is 9.7 percentage points less likely to be a daily laborer amongst attrited households, significant at the 10 percent level. The primary wage earner has 0.458 fewer years of education in attrited households, and is 13.3 percentage points more likely to be a farmer; while there are 0.434 more members and 0.243 more children. However, none of these coefficients is statistically significant. Amongst treatment localities, the only substantial difference is in the size of households, where attrited households have 0.639 more members than non-attrited, though, again, this is not statistically significant.

Column (7) shows the differential attrition across treatment and control. There is a differential attrition rate according to enrollment of 12.9 percentage points, but it is not statistically significant. There are also some small differential attrition rates according to

[10] See Appendix, Table A2 for a fuller comparison across occupational groupings.

the occupation of the primary wage earner – i.e., farmers (-11.9 percentage points), and daily laborers (8.5 percentage points) – but none of these is statistically significant. In conclusion, there is no differential attrition according to observed characteristics across treatment and control that would indicate the sample has become unbalanced in unobservables in ways that might significantly bias our results.

V. Results

The intervention has had a large impact on enrollment, suggesting that the previously low enrollment rate – ranging between 23.74% and 29.35% across the three groups according to the baseline, or 31.13% in the census for control villages – was being driven largely by supply constraints rather than a lack of demand. Columns (5)-(8) in Table 5 display the effect of the two treatments pooled together on enrollment under a variety of specifications controlling for child and household characteristics and district fixed effects. Column (5), which displays the results of a model including only the pooled treatment variable, shows the treatment as leading to an increase in enrollment of 50.9 percentage points. In column (6), where controls are included for child age and gender, the treatment effect is 51.0 percentage points. Column (7) adds controls for household characteristics, including the age, educational attainment, and occupation of the head of household, the size of the household and number of children, and holdings of irrigated land. The treatment effect is 50.6 percentage points. Finally, column (8) includes, in addition to child and household controls, district fixed effects. The treatment effect is 50.7 percentage points. All of these results are significant at the 1% level. The point estimates and standard errors are fairly stable across the four specifications, consistent with the randomization having successfully created comparable treatment groups.

Columns (1)-(4) display the results of regressions employing the same four specifications but disaggregating the treatment into the differential and equal subsidy schemes. Column (1), which includes no controls, finds an effect of the equal and differential subsidies of 50.3 and 51.7 percentage points, respectively. Column (2), which includes child controls, again finds effects of 50.3 and 51.7 percentage points. Column (3), with controls for child and household characteristics, finds effects of 48.8 and 52.8 percentage points. Finally, column (4), with child and household controls and district fixed effects, finds effects of 49.5 and 52.2 percentage points. The point estimates are all significant at the 1% level. As before, these results are relatively stable across specifications. Though the differential subsidy has a slightly larger effect on enrollment than the equal subsidy – ranging from 1.4-4.0 percentage points – the difference is not statistically significant for any specification.

An important issue is the differential effect on boys and girls of the two treatments – indeed, the educational gap being of major concern to policy makers, the differential subsidy was deliberately designed so as to induce greater female enrollment. Table 6 presents the results of regressions interacting treatment and gender variables, so as to measure differential enrollment effects. Columns (5)-(8) pool together the two treatments, with each specification including the vector of controls employed previously. Column (5) shows the results from our most parsimonious specification, including only the gender of the child as a control. Here we find that being assigned to receive an SEF school leads to a 53.9 percentage point increase in enrollment amongst girls. Column (6), which includes child age, shows a 53.7 percentage point increase in enrollment for girls. Column (7), which includes child and household characteristics, shows a 52.8 percentage point increase in enrollment for girls. Finally, column (8), which adds district fixed effects, shows an effect for girls of 53.1 percentage points. All of these results are significant at the 1% level. Across the four specifications, boys showed an increased enrollment 4.0-4.9 percentage points smaller than girls, which is significant at the 10 percent level in the first two specification, and insignificant in the latter two.

We next disaggregate the treatment effects into the two respective treatment groups. Column (1) shows the results from our specification with only the gender control. We find that the equal subsidy leads to an increase of 53.0 percentage points in self-reported enrollment for girls, while the differential subsidy yields an increase of 55.0 percentage points. In the specification including all child controls, column (2), the effects of the two subsidy schemes are 52.8 and 54.8 percentage points respectively. When we include household controls, column (3), the effects become 50.9 and 55.2 percentage points. Finally, when we include district fixed effects, the effects are 51.7 and 54.9 percentage points. All these point estimates are significant at the 1% level, and the results are relatively stable across specifications.

To measure the efficacy of the differential subsidy in inducing higher female enrollment, it is sufficient to compare the coefficients of the two treatment variables. There is some evidence for a differential impact: in our fullest specification, shown in column (4), equal subsidy villages saw a 51.7 percentage point increase in enrollment for girls, whereas differential subsidy villages saw a 54.9 percentage point increase, a difference of 3.2 percentage points. However, with a p-value of 0.2832, we can't rule out the null of no differential effect across treatment groups. Across the four specifications, the difference remains of similar magnitude, while the p-value ranges from 0.256-0.6433. To assess the differential impact across treatment groups for boys, we compare the summation of the treatment 1 and male-treatment 1 coefficients with the sum of the treatment 2 and male-treatment 2 coefficients. Again, there is some evidence of a differential effect, with a difference of 2.2 percentage points and a p-value of 0.3435 for our specification including district fixed effects. Given that there is a differential for boys similar to that for girls between the two treatment groups, we view the results for girls as not being indicative of the differential subsidy inducing greater female enrollment.

In sum, our results indicate that the introduction of SEF schools has had a large impact on child enrollment in these villages. This effect seems to be slightly higher for girls than boys, which is not surprising given the previously higher enrollment rate for boys. There is no statistically significant difference in enrollment across the two treatments for girls, indicating that the increased incentives given to entrepreneurs to enroll female children has no effect. However, this seems to be due primarily to the success of the equal subsidy in inducing high enrollment by girls, rather than a failure of the differential subsidy to encourage female enrollment.

We next explore the relationship of the SEF schools to pre-existing public and private schools in the vicinity of the villages. In column (1) of Table 7, we see that the presence of a government school alone leads to an increased enrollment of 33.20 percentage points, and the existence of a private school alone leads to an increased enrollment of 20.14 percentage points.[11] Where a village lacks any school, government or private, the SEF school leads to an increase of 79.76 percentage points. Where there is already a government school nearby, the impact of the SEF school on enrollment is 34.72 percentage points smaller, and where there is a private school it is 29.11 percentage points smaller. Column (2) estimates these same relationships using district fixed effects. The results are consistent with those found before: the presence of only a government school leads to an increase in enrollment of 35.28 percentage points; and that of a private school to an increase of 21.76 percentage points. Where there is neither a public nor

[11] We have no information on how near the schools are to the village. As discussed at greater length in the Appendix, a village is defined as possessing a public (private) school if there are 5 or more children from the village attending a public (private) school. The fact that the enrollment levels are so low would seem to indicate that many of the public and private schools are at some distance.

private school, the SEF school leads to an increase in enrollment of 81.39 percentage points; which is reduced by 36.80 and 29.68 percentage points by the presence of a government and private school respectively.

One implication of these results is that areas with a private school show lower overall enrollment with the addition of an SEF school than do areas with a government school. With the coefficients on the government school and the government-SEF interaction nearly perfectly cancelling out, we see that a village with a government and an SEF school has an enrollment rate of approximately 80%. In contrast, with the coefficient on the interaction of private-SEF schools exceeding the coefficient on private schools by approximate 9 percentage points, the enrollment rate in villages with SEF and private schools is approximately 71%. We surmise that this is due to areas with a government school being less marginal than areas with a private school, so that education demand is higher for a variety of reasons, most likely having to do with the returns to.

Columns (3)-(6) show the effects of school availability on enrollment in public and private schools. These results are provisional and imprecise, as we identify the type of the school by the name, which cannot always be accurately classified. For this reason, the sample size in these specifications is roughly a thousand children fewer than in the first two columns. Column (3) shows that the presence of a government school leads to an increased enrollment in government schools of 33.13 percentage points. However, where there in an SEF school present, this declines by 18.22 percentage points. When we include district fixed effects, in column (4), the increase in enrollment is 31.20 percentage points, which is decreased by 18.08 percentage points in the presence of an SEF school. In column (5), we find that the presence of a private school leads to an increase in private school enrollment of 19.50 percentage points. When we include district fixed effects, in column (6), the increase is 21.80 percentage points. There is a negative effect of SEF schools on private school enrollment of 9.63 and 11.09 percentage points in the two specifications respectively, though in neither is it statistically significant.

For both public and private schools, we see that the presence of SEF induces significant but not complete crowding-out, and that this crowding-out is more pronounced for public schools than private. This result is consistent with prior research showing the higher quality of private education and the greater availability of female teachers, with tuition costs remaining affordable even for low-income households (Andrabi, et al., 2008; Das, et al., 2006).

In Table 8, we disaggregate these effects by gender. In column (1), we see that the gender-gap in school participation is largely driven by the higher enrollment of boys in available government schools. In villages in which only a government school is available, boys show an 8.96 percentage point (9.98 with district fixed effects) higher enrollment rate than girls, significant at the 1% level (5% with district fixed effects). Interestingly, the presence of SEF schools almost perfectly cancels out this disparity: where SEF schools are present, girls show 8.73 (9.93 with district fixed effects) percentage point gain in enrollment relative to boys. While this may be due to the distance of public schools and the availability of female teachers, it could also be due merely to a significant proportion of these government schools being boys-only, though resolution of this issue must await more detailed results from the follow-up survey.

Columns (3)-(6) again show the effects on enrollment in public and private schools. As before, we add the caveat that enrollment in these schools is imprecisely measured and must be viewed with caution. In column (3), we see that the presence of a government school leads to a 30.06 percentage point increase in enrollment in government schools. When SEF schools are present, enrollment in government schools declines by 18.35 percentage points for girls; for boys, the decline is 5.35 percentage points lower. In column (4), where we include district fixed effects, the presence of a government school leads to a 28.15 percentage point increase in enrollment in government schools. This is reduced by 18.22 percentage points for girls, while boys witness a decline 5.39 percentage points lower. In columns (5) and (6), we see increased enrollment in private schools of 16.72 and 18.90 percentage points without and with district fixed effects respectively. This is reduced for girls by 8.54 and 9.81 percentage points, though the coefficients are not statistically significant. Boys show smaller declines in private school enrollment, decreasing their rate of private enrollment by 4.86 and 5.07 percentage points less than girls.

Columns (3)-(6) indicate that girls are roughly 5 percentage more likely than boys to leave private and public schools in the presence of SEF schools. This is likely due to the advantages offered by SEF schools of lower cost (in the case of private schools), shorter distance, and a greater availability of female teachers. If parents value the education of their daughters less than that of their sons, then they will be less willing to incur the costs of tuition, and this could be driving the shift to SEF schools. Even where parents value the education of their daughters as highly as that of their sons, they may be less willing to send their daughters long distances to school due to security concerns, and will certainly place greater value on instruction by female teachers, both of which could be causing the greater observed switching of girls away from public and private schools to SEF schools.

VI. Conclusion

The intervention studied here, wherein primary education is provided to marginalized communities through public-private partnerships, with the government paying private entrepreneurs a per-child subsidy to operate primary schools, has proven remarkably effective in increasing self-reported enrollment rates amongst primary-aged children. The presence of an SEF school is associated with an approximately 51 percentage point increase in enrollment. In addition, female children show a 4-5 percentage point greater improvement in enrollment in comparison to boys. We find no statistically significant differential impact of the intervention on girls' enrollment across the two treatment types, though this is primarily due to the success of the equal subsidy treatment, rather than the failure of the differential subsidy.

We also find that the gender gap in enrollment was being driven primarily by differential enrollment rates in the presence of government schools, with no evidence of a gender gap in private enrollment. Where only government schools are available, boys are 9-10 percentage points more likely to be enrolled than girls. In the presence of an SEF school, the education gender gap is eliminated. We also find that boys are 5 percentage points more likely to be enrolled in a government school when a government school is present; and are 4 percentage points likelier to be enrolled in a private school when a private school is present. The seeming contradiction between this latter fact and the earlier attribution of enrollment disparities to the presence of government schools is likely driven by a positive correlation in the presence of government and private schools. Full resolution of this issue must await completion of the followup survey.

Our cost effectiveness analysis suggests the dollar cost of inducing a 1% increase in participation lies at the bottom of the range of estimates for interventions subject to rigorous evaluations (Evans and Ghosh, 2008). The returns are likely primarily driven by the strong targeting of the program to initially underserved communities. The impact and cost-effectiveness findings on achievement are pending; test data collection is underway.

VII. Bibliography

Alderman, Harold, Peter F. Orazem, and Elizabeth m. Paterno (2001). "School Quality, School Cost, and the Public/Private School Choices of Low-Income Households in Pakistan." *Journal of Human Resources*, 36(2): 304-26.

Andrabi, Tahir, Jishnu Das, and Asim Ijaz Khwaja (2008). "A Dime a Day: The Possibilities and Limits of Private Schooling in Pakistan," *Comparative Education Review*, 52(3): 329-355.

Banerjee, Abhijit, Suraj Jacob, and Michael Kremer with Jenny Lanjouw and Peter Lanjouw (2000). "Promoting School Participation in Rural Rajasthan: Results from Some Prospective Trials," mimeo, MIT. [RIGHT CITATION?]

Barrera-Osorio, Felipe, Marianne Bertrand, Leigh L. Linden, and Francisco Perez-Calle (2008). "Conditional Cash Transfers in Education Design Features, peer and Sibling Effects Evidence from a Randomized Experiment in Colombia," NBER Working Papers 13890. [RIGHT CITATION?]

Barrera-Osorio, Felipe, Leigh L. Linden, and Miguel Urquiola (2007). "The Effects of User Fee Reductions on Enrollment: Evidence from a quasi-experiment," Working Paper 2007.

Borkum, Evan (2008). "Geographically targeted user fee elimination: Evidence on enrollment from South Africa's no-fee schools," Columbia University Department of Economics Mimeo.

Burde, Dana and Leigh L. Linden (2010). "The Effect of Proximate Schools: A Randomized Controlled Trial in Afghanistan," Working Paper. [RIGHT CITATION?]

Cardoso, Eliana and Andre Portela Souza (2004). "The Impact of Cash Transfers on Child Labor and School Attendance in Brazil," Vanderbit University Working Paper No. 04-W07.

Das, Jishnu, Priyanka Pandey, and Tristan Zajonc (2006). "Learning Levels and Gaps in Pakistan." World Bank Policy Research Working Paper No. 4067, World Bank, Washington, DC.

Duflo, Esther (2001) "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual policy Experiments," *American Economic Review*, 91(4): 795-813.

Evans, David K. and Arkadipta Ghosh (2008). "Prioritizing Educational Investments in Children in the Developing World," RAND Working Paper No. WR-587.

Filmer, Deon and Norbert Schady (2008). "Getting Girls into School: Evidence from a Scholarship Program in Cambodia," *Economic Development and Cultural Change*, 56(3): 581-617.

Glewwe, Paul and Michael Kremer (2005). "Schools, Teachers, and Education Outcomes in Developing Countries," *Handbook on the Economics of Education*, 2: 945-1017.

Glewwe, Paul, Michael Kremer, and Sylvie Moulin (2009). "Many Children Left Behind? Textbooks and Test Scores in Kenya." *American Economic Journal: Applied Economics*, 1(1): 112-35.

Glick, Peter and David E. Sahn (2000). "Schooling of girls and boys in a West African Country: the effects of parental education, income and household structure," *Economics of Education Review*, 19: 63-87.

Government of Pakistan (2007). "Pakistan Social & Living Standards Measurement Survey," Federal Bureau of Statistics.

Hausmann, Ricardo, Laura D. Tyson, and Saadia Zahidi (2009). *The Global Gender Gap Report*. World Economic Forum. Geneva, Switzerland.

Kazianga, Harounan, Daniel Levy, Leigh Linden, Matthew Sloan (2010). "The Effect of Girl-Friendly School Construction: Evaluation of the BRIGHT School Program in Burkina Faso," Columbia University Working Paper.

Kremer, Michael and Alaka Holla (2009). "Improving Education in the Developing World: What Have We Learned From Randomized Evaluations?" *Annual Review of Economics*, 1.: 513-542.

Levy, Dan and Jim Ohls (2006). "Evaluation of Jamaica's Path Program: Final Report," *Mathematica*.

Lloyd, Cynthia B., Cem Mete, and Zeba A. Sathar (2005). "The Effect of Gender Differences in Primary School Access, Type, and Quality on the Decision to Enroll in Rural Pakistan." *Economic Development and Cultural Change*, 53(3): 685-710.

Pitt, Mark M., Mark R. Rosenzweig, and Md Nazmul Hassan (1990). "Productivity, Health, and Inequality in the Intrahousehold Distribution of Food in Low-Income Countries," *American Economic Review*, 80(5): 1139-56.

Schultz, T. Paul (2004). "School subsidies for the poor: evaluating the Mexican Progresa poverty program," *Journal of Development Economics*, 74(1): 199-250.

UNICEF (2010). *Education For All Global Monitoring Report: Reaching the Marginalized*, Oxford University Press [RIGHT CITATION?]

United Nations (2008a). *Fact Sheet: Goal 2 Achieve Universal Primary Education.* United Nations Department of Public Information, Publication Number DPI/2517H, September.

United Nations (2008b). *Fact Sheet: Goal 3 Promote Gender Equality and Empower Women*, United Nations Department of Public Information, Publication Number DPI/2517I, September.

VIII. Appendix

A1. Spin-the-bottle

Because our baseline was gathered by means of the "spin-the-bottle" technique, we might be concerned that it is unreliable for demonstrating treatment effects by means of a before-and-after comparison. Whatever the flaws, however, so long as the methodology was applied consistently across the control and treatment groups, it can be meaningfully used in measuring the effect of the intervention for those households included in the baseline.

Table A1 displays statistics for households found in the census, disaggregated into those that were included in the baseline and those that were not. Columns (1)-(3) give the means for these two groups within control villages, and the difference between them. Columns (4)-(6) and (7)-(9) do the same for the treatment 1 and treatment 2 villages respectively. Columns (10)-(12) give the differences for all villages aggregated together. As can be seen in columns (3), (6), (9), and (12), baseline households systematically differ from non-baseline households in having fewer family members, fewer children, and smaller land holdings.. These differences are relatively large and statistically significant. In column (12), we see that the difference in baseline households have 0.685 fewer members, 0.409 fewer children, and 0.693 fewer acres of land, significant at the 1% and 5% levels. This might be consistent with a model in which enumerators have a selection bias towards houses nearer the center of the village, which are plausibly endowed with less land if we think households tends to be located near the lands they own and this land is located on the outskirts of the village. If this is correct, then the smaller household size and number of children could be due to a correlation between land ownership and household size. Whatever the explanation, the baseline cannot be deemed representative of the village.

Columns (10)-(12) display the coefficients of the interactive variable in a dif-in-dif regression for the two corresponding groups. As can be seen, the coefficients are generally small, and none is statistically significant. This shows that whatever the flaws of the "spin-the-bottle" technique, it has been more-or-less consistently applied, and has yielded a sample that is comparable across treatment and control groups.

A2. School Presence

During the census, there was no systematic collection of information on non-SEF schools located in the vicinity of the village. Rather, for each child reported as being enrolled in school, we asked for the name of the school; then, using this information, we determined whether this name could be identified as belonging to a public, private, or SEF school. This process was necessarily imprecise, and so names deemed doubtful resulted in exclusion of the child from the regression. Once each school had been classified, we then determined whether a village possessed a government or private school by whether the number of children enrolled in one of those schools exceeded a certain threshold. In tables 7 and 8, the threshold used was 5 children: where 5 or more children were identified as enrolled in a public (private) school, that village was determined to have access to a public (private) school and assigned a "1" for the corresponding dummy variable. We experimented with three different thresholds: 1, 3, and 5. In Appendix Tables A4 and A5, we display the results using the threshold of 1 child. As can be seen, the coefficients are largely unchanged.

Table 1: Distribution of Subjects by Research Groups

	Treatment-Control		
	Control	**Treatment 1**	**Treatment 2**
Panel A: All Registrants			
Villages	38	83	79
Families	2089	5150	4560
Children	4616	11348	9416
Boys	2766	6436	5261
Girls	1822	4848	4122

Note: This table displays the distribution of subjects across the various research groups.

Table 2: Characteristics Across Treatments:
Census Households

	Control	Treatment 1	Treatment 2	Treat 1 - Control	Treat 2 - Control	Treat 1 - Treat 2	Enrolled
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Child Characteristics							
male	0.598427	0.5709346	0.5605323	-0.027**	-0.038***	0.01	0.068***
				(0.012)	(0.012)	(0.010)	(0.021)
age	8.353787	8.525412	8.483934	0.172	0.13	0.041	0.030***
				(0.142)	(0.154)	(0.116)	(0.009)
Panel B: Household Characteristics							
household size	7.342162	7.33032	6.718034	-0.012	-0.624	0.612*	0.010**
				(0.397)	(0.398)	(0.314)	(0.005)
number of children	2.305858	2.293065	2.167488	-0.013	-0.138	0.126	-0.028**
				(0.179)	(0.177)	(0.129)	(0.011)
land holdings	2.219398	2.646664	2.132536	0.427	-0.087	0.514	0.006
				(0.521)	(0.456)	(0.393)	(0.004)
education of head of household	2.167732	2.453871	2.489004	0.286	0.321	-0.035	0.011**
				(0.357)	(0.363)	(0.303)	(0.005)
pukka house	0.0441176	0.0431987	0.0568261	-0.001	0.013	-0.014	-0.22
				(0.029)	(0.031)	(0.022)	(0.160)
kaccha house	0.4868154	0.5818766	0.5980596	0.095	0.111	-0.016	-0.183*
				(0.079)	(0.075)	(0.065)	(0.094)
semi-pukka house	0.193712	0.1812337	0.1781012	-0.012	-0.016	0.003	
				(0.068)	(0.063)	(0.054)	
thatched hut	0.275355	0.193691	0.1670132	-0.082	-0.108	0.027	-0.363***
				(0.086)	(0.082)	(0.071)	(0.120)
Panel C: Occupational Characteristics							
farmer	0.5116279	0.4680066	0.4232492	-0.044	-0.088	0.045	-0.145**
				(0.065)	(0.068)	(0.056)	(0.057)
laborer	0.2385073	0.2417966	0.3176138	0.003	0.079	-0.076	-0.075**
				(0.054)	(0.064)	(0.063)	(0.031)
landlord	0.0719308	0.0715751	0.0589484	0	-0.013	0.013	-0.174**
				(0.022)	(0.022)	(0.016)	(0.082)
unemployed	0.0021633	0.004717	0.0023579	0.003	0	0.002	-0.098
				(0.002)	(0.001)	(0.002)	(0.217)
other	0.1757707	0.2139048	0.1978307	0.038	0.022	0.016	
				(0.031)	(0.030)	(0.026)	

Note: This table displays household and child characteristics across treatment and control groups, and a regression predicting enrollment. Columns 1, 2, and 3 give the respective means. Column 4 gives the different between treatment 1 and control; column 5 the difference between treatment 2 and control; and column 6 the difference between treatments 1 and 2. Column 7 displays the coefficients of a regression of child enrollment on child and household characteristics using only control localities. Standard errors are clustered at the village level. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table 3: Characteristics Across Treatments:
Baseline Households

	Control	Treatment 1	Treatment 2	Treat 1 - Control	Treat 2 - Control	Treat 1 - Treat 2	Enrolled
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Child Characteristics							
enrolled	0.2391304	0.2935118	0.2374013	0.054	-0.002	0.056	
				(0.058)	(0.060)	(0.046)	
male	0.6189857	0.585595	0.5692402	-0.033	-0.05	0.016	0.091***
				(0.029)	(0.032)	(0.022)	(0.018)
age	6.918449	6.854232	6.792998	-0.064	-0.125	0.061	0.033***
				(0.093)	(0.099)	(0.072)	(0.006)
Panel B: Household Characteristics:							
household size	7.88587	7.985122	7.225731	0.099	-0.660*	0.759***	0.013***
				(0.375)	(0.370)	(0.283)	(0.004)
number of children	2.113208	2.041534	1.928994	-0.072	-0.184	0.113	-0.025***
				(0.139)	(0.144)	(0.088)	(0.009)
education of primary wage earner	2.394022	2.837363	2.692121	0.443	0.298	0.145	0.017***
				(0.501)	(0.504)	(0.371)	(0.004)
Panel C: Occupational Characteristics:							
farmer	0.6769231	0.6697567	0.6722151	-0.007	-0.005	-0.002	-0.045
				(0.070)	(0.073)	(0.047)	(0.049)
daily laborer	0.1507692	0.1460023	0.1792574	-0.005	0.028	-0.033	-0.066
				(0.054)	(0.059)	(0.040)	(0.053)
shopkeeper	0.0369231	0.0475087	0.0422535	0.011	0.005	0.005	0.021
				(0.019)	(0.018)	(0.014)	(0.067)
civil servant	0.04	0.0440324	0.0268886	0.004	-0.013	0.017	0.003
				(0.020)	(0.019)	(0.012)	(0.059)
other	0.0953846	0.0706837	0.0691421	-0.025	-0.026	0.002	
				(0.031)	(0.032)	(0.018)	

Note: This table displays household and child characteristics across treatment and control groups, and the coefficients on a regression of enrollment on these characteristics. Columns 1, 2, and 3 give the respective means. Column 4 gives the different between treatment 1 and control; column 5 the difference between treatment 2 and control; and column 6 the difference between treatments 1 and 2. Column 7 displays the coefficients and standard errors of a regression of child enrollment on child and household characteristics; district fixed effects are included. Standard errors are clustered at the village level. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table 4: Attrition Rates Across Treatment and Control
Baseline Households

	Control			Treatment			Dif-in-Dif
	Attrit	Non-Attrit	Dif	Attrit	Non-Attrit	Dif	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Child Characteristics							
enrolled	0.1707317	0.2658228	-0.095	0.3344948	0.3006475	0.034	0.129
			(0.061)			(0.053)	(0.080)
male	0.6147541	0.5948052	0.02	0.557554	0.5893358	-0.032	-0.052
			(0.050)			(0.042)	(0.065)
age	7.026087	6.896	0.13	6.857143	6.868421	-0.011	-0.141
			(0.159)			(0.076)	(0.175)
Panel B: Household Characteristics:							
household size	8.470588	8.036458	0.434	8.552239	7.913462	0.639	0.205
			(0.691)			(0.534)	(0.867)
number of children	2.264151	2.020725	0.243	2.074627	2.059846	0.015	-0.229
			(0.262)			(0.162)	(0.305)
education of primary wage earner	2.018868	2.47644	-0.458	2.767442	2.93	-0.163	0.295
			(0.548)			(0.566)	(0.784)
Panel C: Occupational Characteristics:							
farmer	0.7954545	0.6627219	0.133	0.6864407	0.6723044	0.014	-0.119
			(0.088)			(0.067)	(0.110)
daily laborer	0.0681818	0.1656805	-0.097*	0.1440678	0.1564482	-0.012	0.085
			(0.054)			(0.045)	(0.070)
shopkeeper	0.0454545	0.0473373	-0.002	0.0508475	0.0422833	0.009	0.01
			(0.043)			(0.025)	(0.049)
civil servant	0.0227273	0.0414201	-0.019	0.0338983	0.038055	-0.004	0.015
			(0.020)			(0.020)	(0.028)
other	0.0681818	0.0828402	-0.015	0.0762712	0.0739958	0.002	0.017
			(0.054)			(0.028)	(0.060)

Note: This table displays the attrition rates by child and household characteristics across control and treatment groups. Columns 1 and 2 give the means of the respective variables amongst attriting and non-attriting households in Control villages, and Column 3 shows the difference between the two, along with its standard error. Columns 4, 5, and 6 give the same statistics for the Treatment villages. Column 7 gives the results of a Dif-in-Dif regression, showing the differential attrition across treatment and control groups. The outcome variables are the age, sex, and enrollment status of the child. Only List 2 households are included. Households living outside the village at the time of the baseline are excluded from the analysis. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table 5: Effects on Self-Reported School Enrollment Rates

	Enrollment							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment 1	0.503***	0.503***	0.488***	0.495***				
	(0.059)	(0.059)	(0.063)	(0.058)				
Treatment 2	0.517***	0.517***	0.528***	0.522***				
	(0.057)	(0.057)	(0.058)	(0.057)				
Pooled Treatment					0.509***	0.510***	0.506***	0.507***
					(0.055)	(0.055)	(0.059)	(0.057)
H0: Treatment 1 == Treatment 2								
F-Stat	0.1395	0.1335	1.5929	1.2538				
p-value	0.7092	0.7152	0.2085	0.2643				
Child Controls		√	√	√		√	√	√
Household Controls			√	√			√	√
District Fixed Effects				√				√
Observations	0.1962	0.2029	0.2308	0.2469	0.1959	0.2027	0.229	0.2462
R-Squared	16690	16657	15480	15480	16690	16657	15480	15480

Note: This table displays the estimated effects of the respective treatments on students' self-reported Enrollment rates. Column 1 reports the results including only the treatment variables. Column 2 reports results including child controls; Column 3 including both child and household controls; and Column 4 child and household controls, as well as district fixed effects. Child control variables include age and sex. Household controls include the education of the primary wage earner, the size of the household, the number of children, and the size of irrigated land holdings. Standard errors are clustered at the village level. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table 6: Effects on Self-Reported School Enrollment Rates by Gender

	Enrollment							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment 1	0.530***	0.528***	0.509***	0.517***				
	(0.061)	(0.061)	(0.065)	(0.059)				
Male * Treatment 1	-0.043	-0.043	-0.038	-0.039				
	(0.032)	(0.032)	(0.033)	(0.034)				
Treatment 2	0.550***	0.548***	0.552***	0.549***				
	(0.056)	(0.056)	(0.057)	(0.055)				
Male * Treatment 2	-0.056**	-0.054*	-0.042	-0.049				
	(0.028)	(0.028)	(0.030)	(0.030)				
Pooled Treatment					0.539***	0.537***	0.528***	0.531***
					(0.055)	(0.055)	(0.059)	(0.055)
Male * Pooled Treatment					-0.049*	-0.048*	-0.04	-0.044
					(0.028)	(0.028)	(0.030)	(0.030)
H0: Treatment 1 == Treatment 2								
F-Stat	0.2151	0.2251	1.2982	1.1582				
p-value	0.6433	0.6357	0.256	0.2832				
H0: Treat_1 + Male*Treat_1 == Treat_2 + Male*Treat_2								
F-Stat	0.0374	0.0538	1.5657	0.9021				
p-value	0.8469	0.8168	0.2124	0.3435				
Child Controls		√	√	√		√	√	√
Household Controls			√	√			√	√
District Fixed Effects				√				√
R-squared	0.1987	0.2034	0.2311	0.2473	0.1985	0.2032	0.2293	0.2466
Observations	16666	16657	15480	15480	16666	16657	15480	15480

Note: This table displays the estimated effects of the respective treatments on students' self-reported attendance rates. Child controls include gender and age. Household controls include education of the head of household, amount of irrigated land owned, the size of the household, the number of children, and the construction material of dwelling. Standard errors are clustered at the village level. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table 7: Enrollment by School Types

	Enrolled		Enrolled in govt school		Enrolled in priv school	
	(1)	(2)	(3)	(4)	(5)	(6)
treatment	0.7976***	0.8139***	0.0161	0.0045	0.0069	0.0117
	(0.0548)	(0.0547)	(0.0234)	(0.0280)	(0.0326)	(0.0311)
govt school	0.3320***	0.3528***	0.3313***	0.3120***	-0.0117	-0.0047
	(0.0747)	(0.0745)	(0.0541)	(0.0580)	(0.0457)	(0.0435)
priv school	0.2014*	0.2176**	0.0522	0.0384	0.1950**	0.2180***
	(0.1149)	(0.1009)	(0.0876)	(0.0983)	(0.0800)	(0.0800)
treat * govt school	-0.3472***	-0.3680***	-0.1822***	-0.1808***	-0.0228	-0.0255
	(0.0805)	(0.0816)	(0.0604)	(0.0638)	(0.0546)	(0.0550)
treat * priv school	-0.2911**	-0.2968***	-0.0883	-0.0591	-0.0963	-0.1109
	(0.1307)	(0.1107)	(0.0933)	(0.1014)	(0.0941)	(0.0893)
district fixed effects		✓		✓		✓
R-squared	0.232	0.258	0.127	0.140	0.108	0.126
N	16678	16678	15614	15614	15614	15614

Note: This table displays the estimated relationship between the availability of schools and local enrollment. Columns (1) and (2) show the relationship of school availability with overall enrollment, with and without district fixed effects. Columns (3) and (4) show the relationship of school availability with enrollment in government schools, with and without district fixed effects. Columns (5) and (6) show the relationship ov school availability with enrollment in private schools. The threshold for determining presence of a government (private) school is enrollment by 5 or more children in a government (private) school. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table 8: Enrollment by School Types, with Gender

	Enrolled		Enrolled in govt school		Enrolled in priv school	
	(1)	(2)	(3)	(4)	(5)	(6)
treatment	0.7970***	0.8093***	0.0201	0.0101	0.0085	0.0144
	(0.0578)	(0.0603)	(0.0241)	(0.0276)	(0.0327)	(0.0324)
govt school	0.2805***	0.2969***	0.3006***	0.2815***	-0.0085	0.0002
	(0.0772)	(0.0783)	(0.0574)	(0.0595)	(0.0457)	(0.0437)
priv school	0.1915*	0.2089**	0.0631	0.0502	0.1672**	0.1890**
	(0.1119)	(0.1049)	(0.0940)	(0.1027)	(0.0821)	(0.0813)
treat * govt school	-0.2959***	-0.3111***	-0.1835***	-0.1822***	-0.0265	-0.0316
	(0.0837)	(0.0864)	(0.0626)	(0.0649)	(0.0554)	(0.0569)
treat * priv school	-0.3055**	-0.3125**	-0.1180	-0.0908	-0.0854	-0.0981
	(0.1346)	(0.1215)	(0.0984)	(0.1073)	(0.0968)	(0.0913)
male * govt school	0.0896**	0.0998***	0.0535*	0.0539*	-0.0047	-0.0077
	(0.0361)	(0.0370)	(0.0291)	(0.0288)	(0.0064)	(0.0067)
male * treat * govt_sch	-0.0873**	-0.0993**	0.0067	0.0062	0.0056	0.0097
	(0.0409)	(0.0416)	(0.0353)	(0.0354)	(0.0075)	(0.0091)
male * priv school	0.0203	0.0193	-0.0177	-0.0185	0.0486***	0.0507***
	(0.0502)	(0.0513)	(0.0491)	(0.0488)	(0.0171)	(0.0156)
male * treat * priv_sch	0.0205	0.0215	0.0507	0.0535	-0.0178	-0.0212
	(0.0625)	(0.0612)	(0.0572)	(0.0563)	(0.0206)	(0.0191)
male	-0.0051	-0.0149	0.0065	0.0077	0.0023	0.0038
	(0.0188)	(0.0189)	(0.0130)	(0.0132)	(0.0041)	(0.0047)
male * treatment	0.0039	0.0126	-0.0068	-0.0090	-0.0023	-0.0042
	(0.0241)	(0.0241)	(0.0132)	(0.0136)	(0.0048)	(0.0064)
district fixed effects		✓		✓		✓
R-squared	0.235	0.261	0.134	0.147	0.111	0.129
N	16657	16657	15593	15593	15593	15593

Note: This table displays the estimated relationship between the availability of schools, child gender, and local enrollment. Columns (1) and (2) show the relationship of school availability with overall enrollment, with and without district fixed effects. Columns (3) and (4) show the relationship of school availability with enrollment in government schools, with and without district fixed effects. Columns (5) and (6) show the relationship ov school availability with enrollment in private schools. The threshold for determining presence of a government (private) school is enrollment by 5 or more children in a government (private) school. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Tables A1: Baseline Differences from Non-Baseline in Census

	Control			Treatment 1			Treatment 2			All Villages			Treat 1 -Control	Treat 2 -Control	Treat 1 -Treat 2
	BL	non-BL	Dif	BL	non-BL	Dif	BL	non-BL	Dif	BL	non-BL	Dif			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
household size	8.0821	8.8672	-0.785*	8.0476	8.6574	-0.610**	7.2926	7.9420	-0.649***	7.7441	8.4288	-0.685***	0.175	0.136	0.04
			(0.446)			(0.238)			(0.237)			(0.159)	(0.501)	(0.501)	(0.335)
number of children	2.8879	3.3815	-0.494**	2.9835	3.3636	-0.380***	2.7778	3.1673	-0.389***	2.8837	3.2923	-0.409***	0.113	0.104	0.009
			(0.221)			(0.109)			(0.121)			(0.077)	(0.244)	(0.250)	(0.162)
land holdings	2.3858	3.6706	-1.285**	3.1285	3.8683	-0.74	2.1583	2.4654	-0.307	2.6139	3.3072	-0.693**	0.545	0.978	-0.433
			(0.546)			(0.521)			(0.302)			(0.275)	(0.750)	(0.619)	(0.600)
education of hh-head	2.1810	2.0000	0.181	2.4766	2.6230	-0.146	2.3591	2.3178	0.041	2.3793	2.3911	-0.012	-0.327	-0.14	-0.188
			(0.379)			(0.222)			(0.259)			(0.153)	(0.436)	(0.456)	(0.340)
kaccha house	0.0374	0.0366	0.001	0.0571	0.0700	-0.013	0.0491	0.0735	-0.024	0.0505	0.0651	-0.015	-0.014	-0.025	0.012
			(0.010)			(0.014)			(0.017)			(0.009)	(0.017)	(0.019)	(0.022)
pukka house	0.5093	0.5018	0.008	0.6059	0.6041	0.002	0.5830	0.6075	-0.025	0.5804	0.5863	-0.006	-0.006	-0.032	0.026
			(0.050)			(0.030)			(0.036)			(0.021)	(0.058)	(0.062)	(0.047)
semi-pukka house	0.1776	0.2198	-0.042	0.1492	0.1638	-0.015	0.1585	0.1093	0.049*	0.1577	0.1534	0.004	0.028	0.091**	-0.064*
			(0.035)			(0.023)			(0.028)			(0.016)	(0.042)	(0.045)	(0.036)
thatched hut	0.2757	0.2418	0.034	0.1878	0.1622	0.026	0.2094	0.2097	0	0.2113	0.1952	0.016	-0.008	-0.034	0.026
			(0.041)			(0.022)			(0.025)			(0.015)	(0.046)	(0.048)	(0.033)
farmer	0.5094	0.5704	-0.061	0.5037	0.4800	0.024	0.5172	0.5174	0	0.5102	0.5111	-0.001	0.085*	0.061	0.024
			(0.041)			(0.029)			(0.038)			(0.021)	(0.050)	(0.055)	(0.048)
laborer	0.1745	0.1852	-0.011	0.1919	0.1872	0.005	0.2280	0.1974	0.031	0.2038	0.1907	0.013	0.015	0.041	-0.026
			(0.034)			(0.020)			(0.023)			(0.014)	(0.039)	(0.041)	(0.031)
landlord	0.0849	0.0963	-0.011	0.0830	0.1024	-0.019	0.0479	0.0731	-0.025	0.0690	0.0902	-0.021**	-0.008	-0.014	0.006
			(0.022)			(0.016)			(0.018)			(0.011)	(0.027)	(0.028)	(0.024)
unemployed	0.0047	0.0037	0.001	0.0018	0.0048	-0.003	0.0019	0.0073	-0.005	0.0024	0.0055	-0.003	-0.004	-0.006	0.002
			(0.006)			(0.003)			(0.004)			(0.002)	(0.007)	(0.007)	(0.005)
other	0.2264	0.1444	0.082*	0.2196	0.2256	-0.006	0.2050	0.2048	0	0.2147	0.2025	0.012	-0.088*	-0.082	-0.006
			(0.046)			(0.025)			(0.026)			(0.017)	(0.051)	(0.052)	(0.036)

Note: This table displays the household characteristics of baseline and non-baseline households found in the census. Columns (1)-(3) give the means and difference in means for control localities; columns (4)-(6) for treatment 1 localities; and (7)-(9) for treatment 2 localities. Columns (10)-(12) give the differences for all villages. Columns (13)-(15) give the dif-in-dif coefficient for the two relevant groups. Standard errors are clustered at the village level * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table A2: Occupations Across Treatments
Baseline

	Control	Treatment 1	Treatment 2	Treat 1 - Control	Treat 2 - Control	Treat 1 - Treat 2
	(1)	(2)	(3)	(4)	(5)	(6)
farmer	0.6769231	0.6697567	0.6722151	-0.007	-0.005	-0.002
				(0.070)	(0.073)	(0.047)
shopkeeper	0.0369231	0.0475087	0.0422535	0.011	0.005	0.005
				(0.019)	(0.018)	(0.014)
teacher	0.0338462	0.00927	0.0128041	-0.025*	-0.021	-0.004
				(0.013)	(0.014)	(0.005)
trader	0.0092308	0.0162225	0.0179257	0.007	0.009	-0.002
				(0.007)	(0.009)	(0.008)
security services	0.0276923	0.0336037	0.0268886	0.006	-0.001	0.007
				(0.016)	(0.016)	(0.014)
civil servant	0.04	0.0440324	0.0268886	0.004	-0.013	0.017
				(0.020)	(0.019)	(0.012)
daily laborer	0.1507692	0.1460023	0.1792574	-0.005	0.028	-0.033
				(0.054)	(0.059)	(0.040)
raises livestock	0.0246154	0.0115875	0.0115237	-0.013	-0.013	0
				(0.019)	(0.020)	(0.007)

Note: This table displays the distribution of occupations of the primary wage earner across control and treatment groups for the baseline survey. Columns (1)-(3) show the means of these variables. Columns (4)-(6) show the difference in means. Standard errors are clustered at the village level. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table A3: Occupations Across Treatments
Census

	Control	Treatment 1	Treatment 2	Treat 1 - Control	Treat 2 - Control	Treat 1 - Treat 2
	(1)	(2)	(3)	(4)	(5)	(6)
Carpet Weaver	0.00054	0.0004245	0.0028396	0	0.002	-0.002
				(0.001)	(0.002)	(0.002)
Civil Servant	0.0221382	0.0335385	0.0309986	0.011	0.009	0.003
				(0.008)	(0.008)	(0.008)
Private Enterprise	0.0269978	0.0171938	0.0144345	-0.01	-0.013	0.003
				(0.015)	(0.015)	(0.004)
Farm Overseer	0.0091793	0.0004245	0.0016564	-0.009	-0.008	-0.001
				(0.006)	(0.006)	(0.001)
Farmer	0.5323974	0.4916154	0.4387127	-0.041	-0.094	0.053
				(0.065)	(0.068)	(0.058)
House servant	0.0021598	0.0016982	0.0011832	0	-0.001	0.001
				(0.001)	(0.001)	(0.001)
Housewife	0.0026998	0.0029718	0.0023663	0	0	0.001
				(0.002)	(0.002)	(0.001)
Imam	0.0016199	0.0074294	0.0056791	0.006**	0.004*	0.002
				(0.003)	(0.002)	(0.003)
Laborer	0.2483801	0.2519635	0.32584	0.004	0.077	-0.074
				(0.055)	(0.064)	(0.063)
Merchant/trader	0.0766739	0.0766292	0.0575012	0	-0.019	0.019
				(0.022)	(0.022)	(0.016)
Security	0.0091793	0.0163447	0.0186938	0.007	0.01	-0.002
				(0.006)	(0.006)	(0.006)
Livestock	0.0086393	0.019741	0.0085187	0.011**	0	0.011**
				(0.005)	(0.004)	(0.005)
Retired	0.0145788	0.0131607	0.0229531	-0.001	0.008	-0.01
				(0.008)	(0.010)	(0.009)
Shopkeeper	0.0075594	0.0106135	0.0104117	0.003	0.003	0
				(0.004)	(0.004)	(0.004)
Teacher	0.0226782	0.0335385	0.0324184	0.011*	0.01	0.001
				(0.006)	(0.006)	(0.006)
Unemployed	0.012419	0.0178306	0.0234264	0.005	0.011*	-0.006
				(0.005)	(0.006)	(0.005)

Note: This table displays the distribution of occupations of the primary wage earner across control and treatment groups for the census. Columns (1)-(3) show the means of these variables. Columns (4)-(6) show the difference in means. Standard errors are clustered at the village level. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table A4: Enrollment by School Types

	Enrolled		Enrolled in govt school		Enrolled in priv school	
	(1)	(2)	(5)	(6)	(7)	(8)
treatment	0.7767***	0.7860***	0.0088	-0.0050	-0.0124	-0.0126
	(0.0586)	(0.0601)	(0.0172)	(0.0206)	(0.0387)	(0.0378)
govt school	0.2785***	0.2834***	0.3063***	0.2836***	-0.0473	-0.0491
	(0.0812)	(0.0857)	(0.0529)	(0.0504)	(0.0562)	(0.0556)
priv school	0.1822	0.1857*	0.0511	0.0555	0.1799**	0.2048***
	(0.1138)	(0.1124)	(0.0907)	(0.0943)	(0.0712)	(0.0736)
treat * govt school	-0.2950***	-0.3015***	-0.1758***	-0.1752***	0.0120	0.0165
	(0.0870)	(0.0916)	(0.0579)	(0.0545)	(0.0647)	(0.0652)
treat * priv school	-0.2434*	-0.2519**	-0.0468	-0.0199	-0.0979	-0.1087
	(0.1247)	(0.1199)	(0.0968)	(0.0995)	(0.0820)	(0.0800)
district fixed effects		✓		✓		✓
R-squared	0.226	0.251	0.113	0.131	0.096	0.116
N	16678	16678	15614	15614	15614	15614

Note: This table displays the estimated relationship between the availability of schools and local enrollment. Columns (1) and (2) show the relationship of school availability with overall enrollment, with and without district fixed effects. Columns (3) and (4) show the relationship of school availability with enrollment in government schools, with and without district fixed effects. Columns (5) and (6) show the relationship ov school availability with enrollment in private schools. The threshold for determining presence of a government (private) school is enrollment by 1 or more children in a government (private) school. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.

Table A5: Enrollment by School Types, with Gender

	Enrolled		Enrolled in govt school		Enrolled in priv school	
	(1)	(2)	(3)	(4)	(5)	(6)
treatment	0.7775***	0.7834***	0.0101	-0.0010	-0.0074	-0.0055
	(0.0606)	(0.0630)	(0.0173)	(0.0202)	(0.0376)	(0.0379)
govt school	0.2279***	0.2286***	0.2748***	0.2528***	-0.0413	-0.0408
	(0.0831)	(0.0866)	(0.0566)	(0.0531)	(0.0539)	(0.0537)
priv school	0.1736	0.1772	0.0592	0.0642	0.1581**	0.1819**
	(0.1106)	(0.1122)	(0.0944)	(0.0972)	(0.0725)	(0.0741)
treat * govt school	-0.2485***	-0.2505***	-0.1796***	-0.1796***	0.0049	0.0062
	(0.0893)	(0.0934)	(0.0596)	(0.0565)	(0.0637)	(0.0654)
treat * priv school	-0.2567**	-0.2657**	-0.0586	-0.0332	-0.0905	-0.0998
	(0.1263)	(0.1248)	(0.1001)	(0.1046)	(0.0840)	(0.0812)
male * govt school	0.0873**	0.0970**	0.0548*	0.0544**	-0.0101	-0.0143*
	(0.0387)	(0.0400)	(0.0283)	(0.0268)	(0.0079)	(0.0084)
male * treat * govt_sch	-0.0775*	-0.0878**	0.0117	0.0122	0.0122	0.0181
	(0.0432)	(0.0443)	(0.0340)	(0.0328)	(0.0095)	(0.0115)
male * priv school	0.0172	0.0167	-0.0135	-0.0136	0.0380**	0.0402**
	(0.0500)	(0.0521)	(0.0461)	(0.0450)	(0.0180)	(0.0167)
male * treat * priv_sch	0.0195	0.0200	0.0191	0.0212	-0.0115	-0.0144
	(0.0586)	(0.0591)	(0.0535)	(0.0522)	(0.0203)	(0.0192)
male	-0.0078	-0.0177	0.0017	0.0042	0.0067	0.0095
	(0.0169)	(0.0178)	(0.0084)	(0.0086)	(0.0057)	(0.0064)
male * treatment	0.0006	0.0085	-0.0022	-0.0062	-0.0087	-0.0125
	(0.0230)	(0.0237)	(0.0088)	(0.0094)	(0.0065)	(0.0085)
district fixed effects		✓		✓		✓
R-squared	0.229	0.254	0.12	0.138	0.099	0.119
N	16657	16657	15593	15593	15593	15593

Note: This table displays the estimated relationship between the availability of schools, child gender, and local enrollment. Columns (1) and (2) show the relationship of school availability with overall enrollment, with and without district fixed effects. Columns (3) and (4) show the relationship of school availability with enrollment in government schools, with and without district fixed effects. Columns (5) and (6) show the relationship ov school availability with enrollment in private schools. The threshold for determining presence of a government (private) school is enrollment by 1 or more children in a government (private) school. * significant at the 10 percent level, ** at the 5 percent level, and *** at the 1 percent level.