

Supporting Learning In and Out of School: Experimental Evidence from India

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Introduction

- ▶ Dramatic improvements in school enrollment over the past decades...
 - ↳ net primary enrollment currently >90% World Bank (2020)
- ▶ ...not accompanied by comparable improvements in learning outcomes
- ▶ India is a case in point, as shown in our data as well
 - ↳ nearly-universal enrollment for children between the ages of 6 and 14
 - ↳ < 50% of grade 5 students capable of reading a grade 2 text or solving a grade 2 math problem (for more than ten years) (ASER, 2018).

Introduction

- ▶ The COVID-19 pandemic and the associated school closures have further slowed learning
- ▶ Existing evidence primarily focuses on approaches to make schools more effective and the time spent in school more productive (Muralidharan (2017))
 - ↳ Targeted pedagogical interventions that are tailored to the specific needs of the students have been highlighted as one promising approach to enhance **learning** e.g. Glewwe and Muralidharan (2016); Evans (Glewwe et al., 2009; Banerjee et al., 2016; Glewwe and Muralidharan, 2016)
 - ↳ but their effectiveness varies considerably across locations and studies (Angrist and Meager, 2023)

Introduction

In this paper...

- ▶ ...we strengthen a *targeted pedagogical intervention* implemented in school by involving the community to provide study opportunities outside of the traditional school environment.

- 1. an in-school pedagogic program modeled around the well-known *Teaching at the Right Level* approach Banerjee et al. (2016)
 - ↪ delivered through Learning Camps sessions for a total of 30 days

- 2. an out-of-school *Study Groups* program
 - ↪ managed by community volunteers (typically mothers)

- ▶ Cross-cutting randomized experiment across 200 village
 - ↪ Implemented jointly as a full program as well as individual treatment arms

- ▶ Implemented by *Pratham* (largest NGO in education in India)

▶ Literature Details

Introduction

Q: What is the impact on children's learning of the two programs when implemented in isolation as compared to when implemented jointly?

Preview of findings

- i. Study Groups and Learning Camps do NOT have any impact on students' learning when they are implemented in isolation
 - TaRL alone is not effective in our setting
 - ↔ consistent with findings from Angrist and Meager, 2023.
- ii. When the two components are implemented together, the program increases children's learning on average by $\uparrow 0.11$ SD in maths and language
 - ↔ $\uparrow 20\%$ students achieving min standard in math, $\uparrow 13\%$ in language
 - ↔ for attending children $\uparrow 0.4-0.5$ SD (from 2SLS)

Setting and Programs

Setting

- ▶ Nagaon district in Assam, norther India
- ▶ Small villages
 - ~150–200 hhs
 - 1 public primary school per village
 - ~55 students enrolled per school

Learning Camps

- ▶ In-school program based on “Teaching at the Right Level” approach
 - ↪ children are first tested on their learning level
 - ↪ grouped based on their knowledge (rather than on grade)
 - ↪ material and activities appropriate to their level
- ▶ Intensive bursts focused on building foundational skills in reading and arithmetic
 - ↪ 3 camps of 10 days each across one school term (30 days in total)
- ▶ Administered by Pratham staff



Setting and Programs

Study Groups

- ▶ Organized in the village *after* school
- ▶ provides a framework for the community to support studying and learning outside of school
- ▶ Each group managed by a local volunteer (mother)
- ▶ Each group includes 4–7 children
 - ↳ mixed primary school children across age and grades
- ▶ Monthly learning material to support activities provided by Pratham

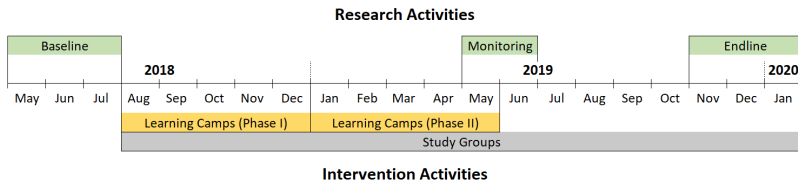


Study Design

- ▶ Cluster-RCT with factorial design (200 villages = 200 public primary school)

		Study Groups		
		No	Yes	
Learning Camps	No	50 villages	50 villages	
	Yes	Phase I	25 villages	25 villages
		Phase II	25 villages	25 villages

- ▶ Timeline (16 months):



Study Design

Data

Collected data from three data sources:

1) School Survey

→ 200 schools

2) Child Survey

→ 5,726 children surveyed in grades 1-4 at baseline (grade 2-5 at endline)

→ key component: ASER math & language tests [▶ Example](#) [▶ Alt. Test](#)

↔ administered individually by trained enumerators

3) Household Survey

→ surveyed 4,592 primary caregivers at baseline

Study Design

Empirical model

$$Y_{i,g,v} = \beta_1(LC\&SG)_v + \beta_2SG_v + \beta_3LC_v + \gamma Y_{i,g,v}^{BL} + \Omega X_{i,g,v} + \mu_g + \epsilon_{i,g,v}$$

- Y : outcome (e.g. test score for child i in grade g and village v)
- $LC\&SG$: full program treatment arm indicator
- SG : Study Group only treatment arm indicator
- LC : Learning Camps only treatment arm indicator
- Y^{BL} : baseline value of Y
- X : additional basic controls (gender and age)
 - ↪ robust to alternative selection using double LASSO Belloni et al (2014)
- μ : grade fixed effects
- ϵ : errors clustered at village level
 - ↪ we also report randomization inference p-values

Results

Preliminary Checks

1. Baseline balance checks

↪ balanced sample at baseline [▶ Schools](#) [▶ children](#) [▶ HHs](#)

2. Attrition at endline

↪ attrition < 7% for children and HHs, and one (0.5%) school

↪ non-differential attrition [▶ Table](#)

3. Program compliance

↪ admin data confirms full compliance with study design

↪ ~5 SGs/village (in SG villages)

↪ ~93% of children in LC villages attended LCs (on avg for 20 days)

Results – Student Learning Outcomes

<i>Dep Var:</i>	Mathematics		Language	
	ASER	Grade II	ASER	Grade II
	(1)	(2)	(3)	(4)
LC & SG	0.11 (0.05)** [0.02]**	0.06 (0.03)** [0.05]**	0.09 (0.04)** [0.03]**	0.04 (0.02)* [0.09]*
SG	-0.01 (0.05) [0.86]	-0.00 (0.03) [0.96]	0.01 (0.04) [0.89]	0.02 (0.02) [0.41]
LC	0.02 (0.05) [0.61]	0.02 (0.03) [0.55]	0.02 (0.04) [0.63]	0.00 (0.02) [0.87]
Basic controls	✓	✓	✓	✓
Mean Control group	-0.00	0.30	-0.00	0.31
R-squared	0.415	0.214	0.580	0.314
Observations	5,328	5,328	5,328	5,328
No. of clusters	200	200	200	200
p-val(LC & SG=SG)	0.03 [0.02]	0.06 [0.06]	0.07 [0.07]	0.40 [0.40]
p-val(LC & SG=LC)	0.08 [0.09]	0.15 [0.13]	0.10 [0.11]	0.12 [0.14]

Notes: The dependent variables are children's ASER test score, normalized using the mean and standard deviation for the control group (columns 1 and 3), and an indicator for the student reaching at least Grade II level in the ASER test (columns 2 and 4). *Basic controls* include: baseline value of the outcome variable, gender, age, and grade fixed effects. Standard errors clustered by village in parenthesis. There are 200 villages. Randomization inference p-values in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Results – Student Learning Outcomes

- ⇒ Learning Camps in the schools and Study Groups in the villages implemented individually, have 0 impact on children's test scores.
- ⇒ Combination of out-of-school Study Groups and in-school Learning Camps
↑learning by ~ 0.11 SD
 - ↪ median effect size out of 270 education programs Evans and Yuan (2021)
 - ↪ increase of 20% (13%) of children that achieve minimum standards (i.e. grade 2 level) in mathematics (language)
- ▶ As Angrist and Meager (2023) point out, program implementation and, in particular, program uptake is a key determinant for impact.
 - ↪ next, estimate the impact of direct participation (2SLS)

Results – Direct Participation (2SLS)

- ▶ ↑ participation associated with ↑ ↑ learnings [* Details](#)
- ▶ Confirmed by 2SLS (fairly strong assumptions)
 - ↔ participation in the full program ↑ learning by 0.4-0.5SD (LATE)

<i>ASER score:</i>	<i>Model:</i> OLS		2SLS	
	Math.	Lang.	Math.	Lang.
	(1)	(2)	(3)	(4)
LC & SG	0.11** (0.05)	0.09** (0.04)	0.51** (0.25)	0.40* (0.21)
SG	-0.01 (0.05)	0.01 (0.04)	-0.06 (0.38)	0.04 (0.32)
LC	0.02 (0.05)	0.02 (0.04)	0.01 (0.07)	0.01 (0.06)
Basic controls	✓	✓	✓	✓
Mean Control group	-0.00	-0.00	-0.00	-0.00
Observations	5,328	5,328	5,328	5,328
F-stat. LC & SG			31.09	31.39
F-stat. SG			17.24	17.15
F-stat. LC			555.24	550.56

Notes: The dependent variables are children's ASER test score, normalized using the mean and standard deviation for the control group. *Basic controls* include: baseline value of the outcome variable, gender, age, and grade fixed effects. In columns 3 and 4, participation in the programs is measured as follows: *LC & SG* = child attended at least 50% of the LC AND reported ever attending the SG; *SG* = child reported ever attending the SG BUT attended less than 50% of the LC; *LC* = child attended at least 50% of the LC BUT reported never attending the SG. These variables are instrumented using assignment indicators to the different treatment arms. F-stat from the first stage reported at the bottom of the table. Standard errors clustered by village in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Results

Additional insights on program design:

1. Timing (randomized)

- ↪ children exposed to Learning Camps earlier, learned significantly more
- ⇒ put children on a different learning trajectory

2. Heterogeneous effects

- no differential impact by starting level, grade, or gender

3. Inputs substitution

- ↪ ↓ Schools' investments and engagement with stakeholders
- ⇒ potentially diluted impact of the program

Results – Cost Effectiveness

- ⇒ Combination of out-of-school Study Groups and in-school Learning Camps
↑learning by ~ 0.11 SD

Cost Effectiveness analysis [▶ Details](#)

1. What is the cost-effectiveness of the full program?
 - ↔ ~ 0.6 SD gains per 100 US\$
 - ↔ in line with average cost-effectiveness of educ programs in the literature
Bhula et al, 2013, Bando et al, 2019 [▶ Details](#)
2. What is the cost-effectiveness of adding the SG to a standard LC program?
 - ↔ ~ 6.5 SD gains per 100 US\$ (!)
 - ⇒ large gains from including the (cheap) out-of-school (Study Group) component

Conclusion

- ▶ Targeted pedagogical interventions is one of the most popular approaches for promoting learning across low-income settings (Global Education Evidence Advisory Panel 2020).
 - ↪ large variation in impact across settings and studies
 - ↪ understanding how to make these programs more effective is a high priority.
- ▶ We provide experimental evidence on the impact of an educational program that combines a standard in-school targeted pedagogical intervention with a community-managed out-of-school program.
- ▶ Neither Learning Camps nor Study Groups have any impact on children's learning when implemented on its own
- ▶ The program that combines out-of-school Study Groups with with standard in-school pedagogical intervention (Learning Camp) raises learning outcomes by ~ 0.11 SD
 - Children who participated in the program full time gained learning by 0.38 and 0.48 SD.

Conclusion

- ▶ Our findings speak to the multidimensionality of the learning process
 - Educational programs that intervene on several dimensions at the same time can take advantage of complementarities and lead to significant learning gains for the children.
 - highlight the important role that out-of-school learning interventions can play, despite having received little attention so far both in policy and in the literature
- ▶ Our study highlights that even successful programs need to be continuously adapted to new contexts and revised in order to preserve (or enhance) their effectiveness.

Thank you!

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Setting and Programs

Table 1: % Children in government schools in Std V who can read Std II level text, 2008-2018

	2008	2010	2012	2014	2016	2018
India	53.1	50.7	41.7	42.2	41.7	44.2
Group 1						
Kerala	73.3	74.0	59.9	61.3	63.3	73.1
Maharashtra	74.3	71.0	55.3	51.7	63.1	66.0
Punjab	61.3	68.7	69.5	60.9	64.0	68.7
Uttarakhand	64.6	63.7	52.2	52.0	55.9	58.0
Haryana	61.1	60.7	43.5	53.9	54.6	58.1
Chhattisgarh	74.1	61.0	44.0	47.1	51.0	57.1
Assam	40.9	42.6	33.3	30.6	32.2	33.5
Madhya Pradesh	86.8	55.2	27.5	27.5	31.4	34.4
Group 2						
Karnataka	42.9	42.9	47.2	45.7	41.9	47.6
Himachal Pradesh	73.6	75.7	71.2	71.5	65.3	74.5
Odisha	59.6	45.5	46.1	49.1	48.8	56.2
Uttar Pradesh	33.4	36.0	25.6	26.8	24.3	36.2
Group 3						
Jharkhand	51.9	48.4	32.5	29.1	31.4	29.4
West Bengal	45.2	54.2	48.7	51.8	50.2	50.5
Gujarat	43.8	43.5	46.3	44.6	52.3	52.0
Rajasthan	45.1	44.2	33.3	34.4	42.5	39.1
Tamil Nadu	26.7	30.9	30.2	49.9	49.4	46.3
Bihar	62.8	57.9	43.1	44.6	38.0	35.1

Table 4: % Children in government schools in Std V who can do division, 2008-2018

	2008	2010	2012	2014	2016	2018
India	34.4	33.9	20.3	20.7	21.1	22.7
Group 1						
Himachal Pradesh	57.4	61.8	40.7	37.9	47.4	51.5
Punjab	39.7	70.8	48.6	37.1	42.4	50.1
Uttar Pradesh	15.8	18.7	9.1	12.1	10.4	17.0
Kerala	38.3	43.1	38.0	25.6	27.1	33.5
Chhattisgarh	59.5	37.8	13.1	14.1	18.6	26.1
Maharashtra	46.9	39.9	20.2	16.6	19.7	31.7
Madhya Pradesh	77.5	38.0	8.9	10.0	15.3	16.5
Gujarat	24.1	19.6	12.4	13.9	14.5	18.4
Uttarakhand	38.4	48.7	27.3	21.4	25.5	26.7
Group 2						
Assam	15.5	22.6	8.9	9.0	9.1	14.4
West Bengal	29.4	38.1	28.7	31.3	28.6	29.2
Haryana	45.7	50.5	25.4	30.8	30.1	34.4
Karnataka	14.9	18.7	17.4	16.7	17.2	19.6
Tamil Nadu	9.0	14.1	9.6	25.6	21.4	27.1
Group 3						
Bihar	50.9	51.0	30.0	31.4	28.9	24.1
Jharkhand	30.5	40.1	20.1	17.6	20.0	15.6
Rajasthan	25.9	25.2	9.9	12.0	15.6	14.1
Odisha	36.0	31.3	17.2	19.9	23.8	23.8

Variable	(1) Assam state		(2) Nagaon district		(3) Sample		T-test Difference	
	N	Mean/SE	N	Mean/SE	N	Mean/SE	(3)-(1)	(3)-(2)
Urban (Y/N)	57732	0.036 (0.001)	3112	0.054 (0.004)	200	0.025 (0.011)	-0.011	-0.029*
No. classrooms	57732	2.314 (0.008)	3112	2.459 (0.044)	200	2.685 (0.087)	0.371***	0.226
No. students	57732	65.518 (0.260)	3112	127.949 (2.381)	200	54.425 (1.530)	-11.093**	-73.524***
Teach-to-stud. ratio	57158	0.098 (0.001)	3093	0.077 (0.002)	200	0.089 (0.012)	-0.009	0.012*
Share teach. w/ prof. qual.	57428	0.635 (0.002)	3103	0.597 (0.008)	200	0.730 (0.025)	0.095***	0.133***
Instr. in Assamese (Y/N)	57732	0.735 (0.002)	3112	0.972 (0.003)	200	0.995 (0.005)	0.260***	0.023*
School funds received	57732	7910.585 (145.476)	3112	7216.355 (350.402)	200	7460.000 (294.918)	-450.585	243.645
Electricity (Y/N)	57732	0.155 (0.002)	3112	0.337 (0.008)	200	0.190 (0.028)	0.035	-0.147***
Playground (Y/N)	57732	0.556 (0.002)	3112	0.691 (0.008)	200	0.585 (0.035)	0.029	-0.106***
CCE implemented (Y/N)	57732	0.912 (0.001)	3112	0.905 (0.005)	200	0.920 (0.019)	0.008	0.015
Pupil records maintained (Y/N)	57732	0.887 (0.001)	3112	0.863 (0.006)	200	0.880 (0.023)	-0.007	0.017
SMC instituted (Y/N)	57732	0.936 (0.001)	3112	0.866 (0.006)	200	1.000 (0.000)	0.064***	0.134***
Workdays	57732	192.920 (0.373)	3112	171.208 (1.990)	200	244.130 (1.269)	51.210***	72.922***
Teach. work. hrs/day	57732	4.903 (0.010)	3112	4.452 (0.053)	200	6.374 (0.078)	1.471***	1.922***
No. of inspections	57732	2.435 (0.020)	3112	2.553 (0.091)	200	3.810 (0.441)	1.375***	1.257***

Notes: Data comes from the 2017-18 Unified District Information System for Education (UDISE) kept by the Ministry of Education. CCE indicates Continuous and Comprehensive Evaluation assessment process. The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Study Design

ASER test (language)

READING TEST SAMPLE (1)



Letter

b	s	o
k	m	
y	r	h
t	x	

Ask the child to recognize any 5 letters. At least 4 must be correct.

Word

ring	bad
	ball
cold	king
clap	foot
	fan
girl	crow

Ask the child to read any 5 words. At least 4 must be correct.

Study Design

ASER test (language)

READING TEST SAMPLE (1)



Story

Salma is a little girl. She had a pretty doll. She loved playing with her doll. One day the doll fell from her hand to the floor. It broke into many pieces. Salma was very sad. She cried a lot. Her mother gave her another doll. Now she is happy again.

Para

**Ravi is a boy.
He has many friends.
He loves to draw.
He does not like to sing.**

Para

**My village is very big.
It has many houses.
It also has a shop.
The bus stops in my village.**

Study Design

ASER test (mathematics)

MATH TEST SAMPLE (1)



Number recognition 1–9	Number recognition 10–99	Subtraction		Division
<input type="text" value="1"/> <input type="text" value="4"/>	<input type="text" value="51"/> <input type="text" value="83"/>	$\begin{array}{r} 46 \\ - 29 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ - 39 \\ \hline \end{array}$	$7 \overline{)879}$
<input type="text" value="7"/> <input type="text" value="3"/>	<input type="text" value="37"/> <input type="text" value="65"/>	$\begin{array}{r} 47 \\ - 28 \\ \hline \end{array}$	$\begin{array}{r} 45 \\ - 17 \\ \hline \end{array}$	$6 \overline{)824}$
<input type="text" value="6"/> <input type="text" value="9"/>	<input type="text" value="55"/> <input type="text" value="26"/>	$\begin{array}{r} 92 \\ - 76 \\ \hline \end{array}$	$\begin{array}{r} 84 \\ - 57 \\ \hline \end{array}$	$8 \overline{)985}$
<input type="text" value="5"/> <input type="text" value="2"/>	<input type="text" value="91"/> <input type="text" value="43"/>	$\begin{array}{r} 52 \\ - 14 \\ \hline \end{array}$	$\begin{array}{r} 66 \\ - 48 \\ \hline \end{array}$	$4 \overline{)517}$
<input type="text" value="36"/> <input type="text" value="27"/>				
Ask the child to recognize any 5 numbers. At least 4 must be correct.	Ask the child to recognize any 5 numbers. At least 4 must be correct.	Ask the child to do any 2 subtraction problems. Both must be correct.		Ask the child to do any 1 division problem. It must be correct.

Study Design

Alternative Test

Q1. Read out each of the following letters

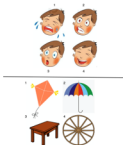
ম চ কলম পানী
ফ য় নিগনি গৰু

Q2. Read out each of the following words

Q3. Which of the following containers has more water?



Q4a. Which of the following images matches the word (in eye)?



Q5. For each of the following images:

- Identify the object
- Identify the first letter of the word



Q6a/b. For each of the following images, point out the word that matches the image



গছ
গল
মাছ

ফলি
জল
ফল

কুৰ
ঘৰ
কৰ

Q6c. Which of the above images is a circle?

Q7a. What goes in the box?



$$\boxed{3} + \boxed{3} = \boxed{}$$



$$\boxed{4} - \boxed{1} = \boxed{}$$



Q7a/b. Calculate

$\begin{array}{r} 16 \\ + 14 \\ \hline \end{array}$	$\begin{array}{r} 30 \\ - 7 \\ \hline \end{array}$
-----------------------------------------------------	----------------------------------------------------

Q10. What goes in the empty box?

$\boxed{}$	$\boxed{}$
8	9

Q8c. How many stars are there?



Q8a/b. Calculate

$\begin{array}{r} 7 \\ + 6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ - 5 \\ \hline \end{array}$
---------------------------------------------------	---------------------------------------------------

Q11. How many more bananas would you need to make a total of 5 bananas?



Study Design

Baseline Data

Table: Baseline Balance Checks – Schools

	C	SG & LC	SG	LC	p-value
Number of classrooms	2.26 (1.12)	2.00 (1.73)	2.06 (1.39)	2.14 (1.11)	0.79
Total staff members	4.12 (2.56)	3.70 (3.29)	3.58 (2.07)	3.98 (2.14)	0.64
Share absent past week	0.34 (0.38)	0.31 (0.42)	0.23 (0.30)	0.27 (0.35)	0.46
Total enrollment	55.72 (19.85)	52.52 (20.57)	52.92 (23.42)	52.60 (20.73)	0.83
Share of girls enrolled	0.51 (0.11)	0.49 (0.07)	0.51 (0.08)	0.50 (0.07)	0.68
Share of stud. present	0.66 (0.22)	0.74 (0.20)	0.69 (0.22)	0.65 (0.23)	0.13
School quality index	0.13 (1.04)	0.04 (1.64)	-0.06 (1.45)	-0.10 (1.96)	0.87
Avg math level (weighted)	1.60 (0.35)	1.63 (0.33)	1.61 (0.42)	1.55 (0.37)	0.70
Avg lang. level (weighted)	2.06 (0.62)	2.05 (0.69)	1.98 (0.72)	1.92 (0.69)	0.70
NGO visit to school	0.02 (0.14)	0.04 (0.20)	0.04 (0.20)	0.04 (0.20)	0.89
	50	50	50	50	
Observations					

Notes: The last column reports the p-value from testing whether the mean is equal across all treatment groups (H_0 := mean is equal across groups).

Study Design

Baseline Data

Table: Baseline Balance Checks - Children

	C	LC & SG	SG	LC	p-value
Age	7.69 (1.59)	7.64 (1.55)	7.61 (1.53)	7.61 (1.56)	0.77
Girl	0.51 (0.50)	0.49 (0.50)	0.50 (0.50)	0.50 (0.50)	0.80
Present in school	0.68 (0.47)	0.75 (0.44)	0.74 (0.44)	0.68 (0.47)	0.35
Likes going to school [1-5]	4.51 (0.89)	4.54 (0.85)	4.57 (0.81)	4.59 (0.78)	0.33
Study outside school	0.71 (0.45)	0.75 (0.43)	0.74 (0.44)	0.76 (0.43)	0.25
ASER score (language)	1.75 (1.44)	1.72 (1.43)	1.66 (1.42)	1.63 (1.41)	0.78
ASER score (math)	1.42 (0.84)	1.43 (0.85)	1.40 (0.89)	1.35 (0.85)	0.67
Tracked at endline (share)	0.94 (0.24)	0.93 (0.25)	0.92 (0.28)	0.93 (0.25)	0.59
Observations	1,496	1,441	1,360	1,429	

Notes: The last column reports the p-value from testing whether the mean is equal across all treatment groups (H_0 := mean is equal across groups).

Study Design

Baseline Data

Table: Baseline Balance Checks – Households

	C	LC & SG	SG	LC	p-value
# HH members	5.24 (1.76)	5.15 (1.65)	5.21 (1.70)	5.30 (1.82)	0.55
# children enrolled	1.44 (0.82)	1.42 (0.78)	1.47 (0.82)	1.43 (0.84)	0.61
Asset index	-0.10 (1.89)	0.19 (1.78)	-0.13 (1.81)	0.04 (1.83)	0.23
Primary caregiver is literate	0.48 (0.50)	0.53 (0.50)	0.51 (0.50)	0.50 (0.50)	0.73
Would like child to go to university	0.44 (0.50)	0.45 (0.50)	0.45 (0.50)	0.49 (0.50)	0.61
Pays tuition	0.19 (0.39)	0.24 (0.43)	0.19 (0.40)	0.21 (0.41)	0.27
Estimates math level correctly	0.39 (0.49)	0.37 (0.48)	0.38 (0.49)	0.36 (0.48)	0.69
Estimates language level correctly	0.33 (0.47)	0.34 (0.47)	0.30 (0.46)	0.33 (0.47)	0.37
Tracked at endline (share)	0.95 (0.22)	0.93 (0.25)	0.93 (0.26)	0.94 (0.24)	0.38
Observations	1,147	1,152	1,137	1,156	

Notes: Notes: The last column reports the p-value from testing whether the mean is equal across all treatment groups (H_0 := mean is equal across groups).

Results

Attrition checks

<i>Dep Var:</i>	<i>Indicator for missing at endline</i>					
	<i>Interaction with...</i>		Grade	Girl	ASER	
					Math	Language
	(1)	(2)	(3)	(4)	(5)	(6)
LC & SG	0.004 (0.014)	0.006 (0.014)	0.016 (0.028)	0.000 (0.018)	0.002 (0.027)	-0.001 (0.021)
SG	0.019 (0.015)	0.021 (0.015)	0.038 (0.028)	0.018 (0.018)	0.025 (0.027)	0.033 (0.024)
LC	0.007 (0.015)	0.009 (0.014)	-0.005 (0.025)	0.012 (0.019)	-0.005 (0.024)	-0.002 (0.020)
LC & SG × ...			-0.004 (0.009)	0.013 (0.019)	0.004 (0.013)	0.004 (0.006)
SG × ...			-0.007 (0.009)	0.007 (0.017)	-0.003 (0.012)	-0.008 (0.008)
LC × ...			0.005 (0.008)	-0.007 (0.018)	0.009 (0.011)	0.006 (0.006)
Basic Controls	✗	✓	✓	✓	✓	✓
Mean control group	0.06	0.06	0.06	0.06	0.06	0.06
R-squared	0.001	0.017	0.017	0.017	0.022	0.025
Observations	5,726	5,726	5,726	5,726	5,726	5,726
No. of clusters	200	200	200	200	200	200

Notes: All regressions with interactions include interaction components as well (not reported). Standard errors clustered by village in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Results

Program exposure – School

Dep Var:	Pratham		Learning Camps		Study
	Heard of	Interacted with	Direct question	Students in groups	Groups in village
	(1)	(2)	(3)	(4)	(5)
LC & SG	0.58*** (0.07)	0.92*** (0.04)	0.22*** (0.06)	0.62*** (0.08)	0.74*** (0.06)
SG	0.46*** (0.09)	0.78*** (0.06)	0.10** (0.05)	0.23** (0.09)	0.55*** (0.07)
LC	0.54*** (0.08)	0.88*** (0.05)	0.22*** (0.06)	0.58*** (0.08)	0.34*** (0.07)
Mean Control	0.38	0.02	0.02	0.16	0.02
R-squared	0.309	0.634	0.064	0.264	0.310
Observations	199	199	199	199	199
p-val(LC & SG=SG)	0.04	0.03	0.13	0.00	0.05
p-val(LC & SG=LC)	0.40	0.47	1.00	0.64	0.00

Notes: Robust standard errors in parenthesis. Randomization inference p-values in square bracket *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Results

Program exposure – Children

Dep Var:	Pratham		Learning Camps			Study Groups	
	Heard of	Interacted with	Pratham Tested	Pratham Teachers	Divided in groups	Village	Participated
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LC & SG	0.16 (0.03)*** [0.00]***	0.36 (0.03)*** [0.00]***	0.13 (0.02)*** [0.00]***	0.10 (0.02)*** [0.00]***	0.35 (0.03)*** [0.00]***	0.24 (0.03)*** [0.00]***	0.21 (0.03)*** [0.00]***
SG	0.05 (0.02)** [0.02]**	0.21 (0.03)*** [0.00]***	0.03 (0.02)** [0.03]**	0.01 (0.01) [0.14]	0.16 (0.03)*** [0.00]***	0.16 (0.03)*** [0.00]***	0.14 (0.03)*** [0.00]***
LC	0.10 (0.02)*** [0.00]***	0.27 (0.03)*** [0.00]***	0.08 (0.01)*** [0.00]***	0.06 (0.01)*** [0.00]***	0.28 (0.03)*** [0.00]***	0.01 (0.01) [0.46]	0.01 (0.01) [0.34]
Basic controls	✓	✓	✓	✓	✓	✓	✓
Mean Control	0.08	0.34	0.05	0.03	0.24	0.07	0.03
R-squared	0.035	0.094	0.032	0.026	0.095	0.085	0.082
Observations	5,328	5,328	5,328	5,328	5,328	5,328	5,328
No. of clusters	200	200	200	200	200	200	200
p-val(LC & SG=SG)	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.05 [0.04]	0.05 [0.05]
p-val(LC & SG=LC)	0.02 [0.02]	0.01 [0.01]	0.02 [0.03]	0.04 [0.05]	0.04 [0.04]	0.00 [0.00]	0.00 [0.00]

Notes: *Basic controls* include: gender, age, and grade fixed effects. Standard errors clustered by village in parenthesis. Randomization inference p-values in square bracket. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

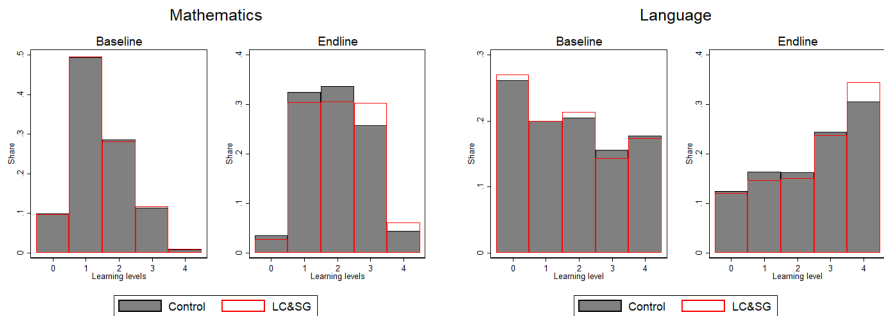
Results

Program Exposure – Household

Dep Var:	Pratham			Learning Camps			Study
	Heard of	Interacted	Material	In school	TL activities	Diff. gr.	Groups
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LC & SG	0.15 (0.02)*** [0.00]***	0.09 (0.02)*** [0.00]***	0.36 (0.03)*** [0.00]***	0.12 (0.02)*** [0.00]***	0.10 (0.01)*** [0.00]***	0.23 (0.03)*** [0.00]***	0.26 (0.03)*** [0.00]***
SG	0.09 (0.02)*** [0.00]***	0.06 (0.01)*** [0.00]***	0.25 (0.03)*** [0.00]***	0.08 (0.02)*** [0.00]***	0.06 (0.01)*** [0.00]***	0.14 (0.03)*** [0.00]***	0.23 (0.03)*** [0.00]***
LC	0.08 (0.02)*** [0.00]***	0.03 (0.01)** [0.01]**	0.24 (0.02)*** [0.00]***	0.05 (0.01)*** [0.00]***	0.04 (0.01)*** [0.00]***	0.13 (0.02)*** [0.00]***	0.04 (0.01)*** [0.00]***
Basic controls	✓	✓	✓	✓	✓	✓	✓
Mean Control	0.07	0.02	0.10	0.02	0.02	0.05	0.02
R-squared	0.024	0.020	0.084	0.028	0.023	0.050	0.101
Observations	4,251	4,224	4,265	4,251	4,251	4,265	4,265
No. of clusters	200	200	200	200	200	200	200
p-val(LC & SG=SG)	0.02 [0.02]	0.19 [0.19]	0.00 [0.00]	0.04 [0.04]	0.03 [0.03]	0.02 [0.02]	0.57 [0.57]
p-val(LC & SG=LC)	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]	0.00 [0.01]	0.00 [0.00]

Notes: *Basic controls* include: gender and age of the child associated to the household, as well as grade fixed effects. Standard errors clustered by village. Randomization inference p-values in square bracket. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Control vs Full program distribution comparison



▶ Back

Results

Discussion - Cost Effectiveness

	LC & SG	LC	SG	(1) - (2)
	(1)	(2)	(3)	(4)
Total costs (yearly)	34,253	31,756	19,853	2,497
Personnel	23,685	23,685	13,293	0
TLM	5,369	3,454	3,398	1,916
Training	2,619	2,037	582	582
Travel	614	614	614	0
Other Costs	1,966	1,966	1,966	0
# years	1.33	1.33	1.33	1.33
# villages served	50	50	50	50
# children served per village	53	53	53	53
Avg cost per student	17.2	15.9	10.0	1.3
Avg learning gains (SD)	0.09 - 0.11	0.018 - 0.023	-0.01 - 0.01	0.07 - 0.09
Cost per 0.1 SD gain	15.0 - 18.3			1.34 - 1.72
Additional SD per 100 US\$	0.55 - 0.67			5.81 - 7.48

Notes: all measures expressed in US\$. Column 4 shows the difference in costs between implementing the joint program (column 1) and implementing only the Learning Camps (column 2).

Results

Discussion - Cost Effectiveness

