Mainstreaming an Effective Intervention

Evidence from Randomized Evaluations of "Teaching at the Right Level"in India

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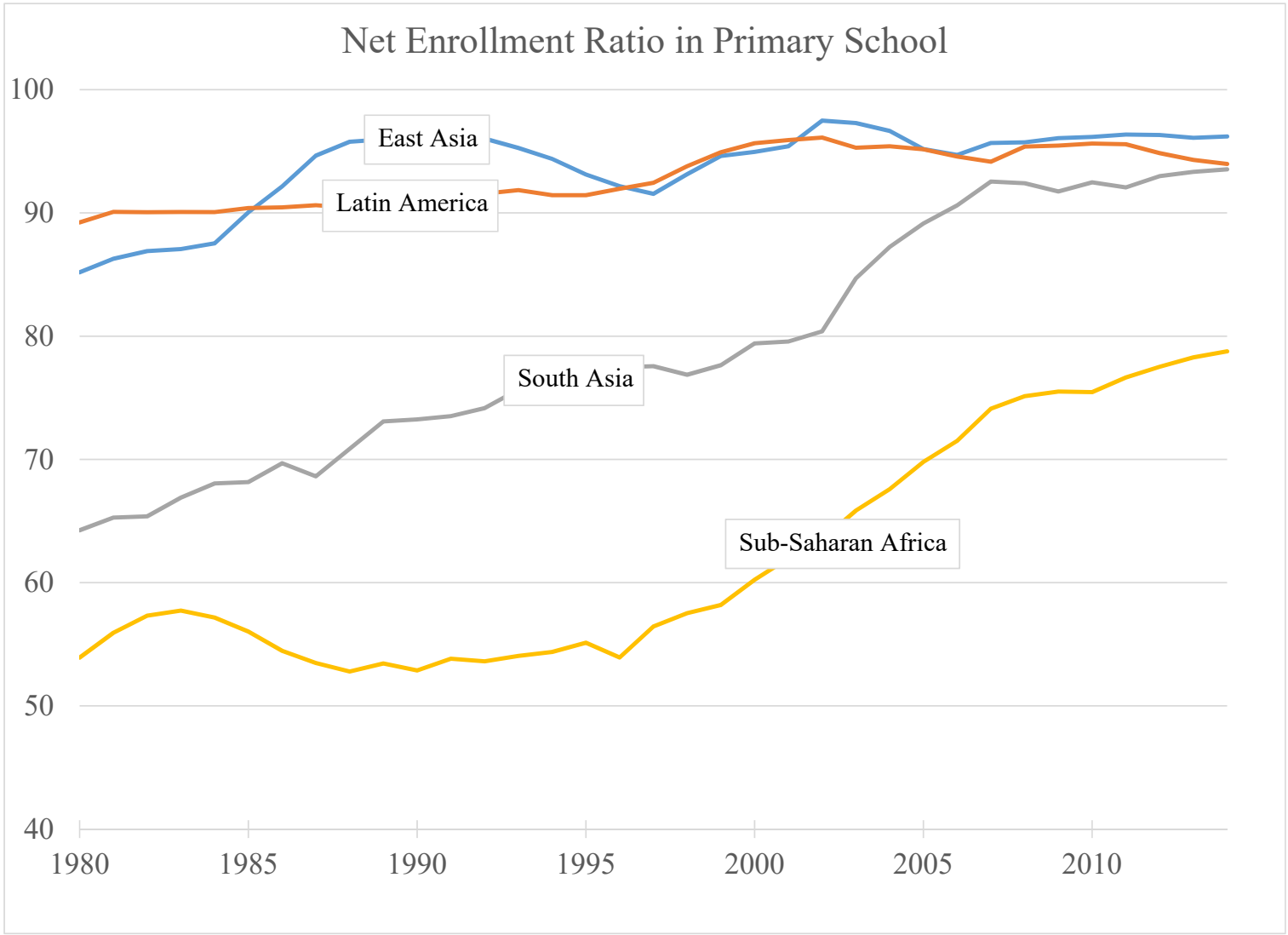
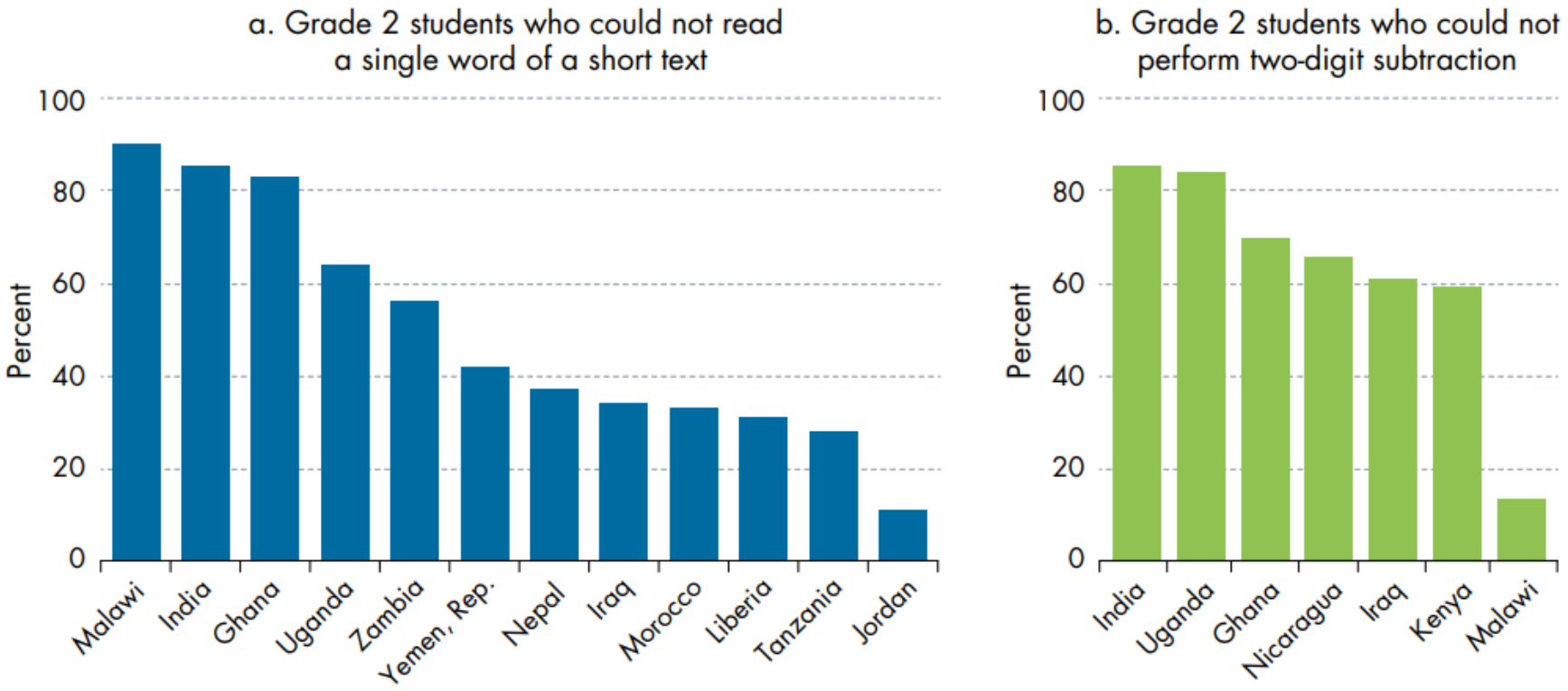
Trends in Primary-school enrollment



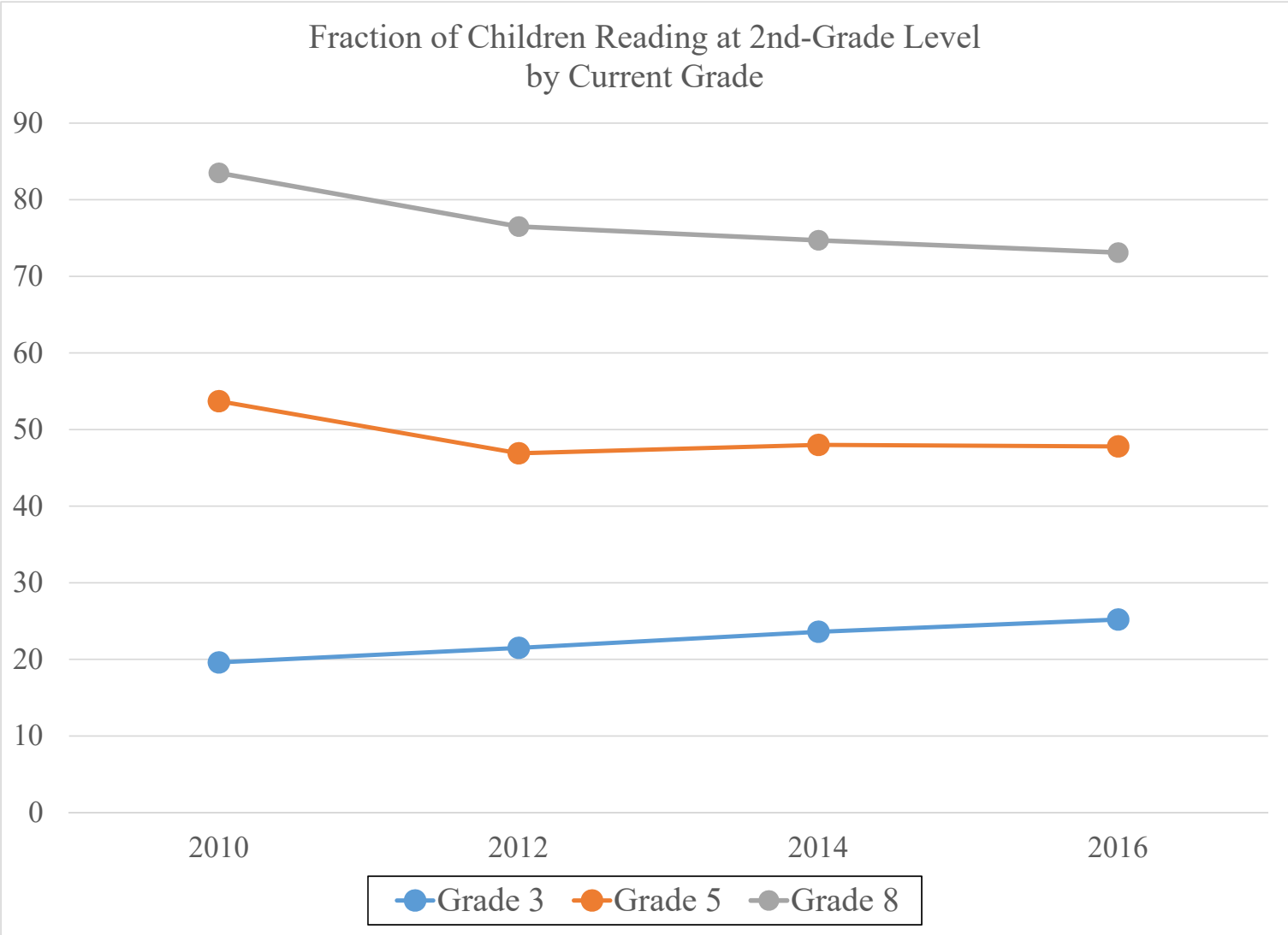
Students in School Are Not Achieving basic Literacy and Numeracy

Percentage of grade 2 students who could not perform simple reading or math tasks, selected countries



Source 2018 World Development Report

India follows these patterns



Source: 2016 ASER Report

What are the issues? (Supply Side)

- Lack of infrastructure (school buildings, desks, chalk, etc)
- Teachers: poor training, motivation
  - Teachers are relatively well paid "civil servants"—might not have the right characteristics to relate to kids from poor backgrounds
  - Instant and permanent tenure $\rightarrow$ little incentive to perform well
- Curriculum
  - Prescribed syllabus for each grade
  - Automatic grade promotion
  - Many children fall behind and never catch up

Potential solutions

- Physical Inputs
  - Provide infrastructure (school buildings, desks, chalk, etc)
- Change approach to teaching
  - Hire new teachers / para-teachers
  - Change pedagogy
    - Use new teachers
    - Train existing teachers

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Pratham's Approach

Strategy: "Teaching at the Right Level" (TaRL), developed by NGO Pratham

- Pratham:
  - Started in slums in Mumbai in mid-1990s
  - Today, largest education-focused NGO in India
- Pratham's TaRL Approach: Teach at children's current learning level, not a prescribed syllabus
  - Divide grade (or multiple grades) by initial learning level
  - Teach activities specific to level
  - Focus on *basic* reading and mathmatics skills
  - Provide level-appropriate materials
  - More active learning—less rote learning, such as students repeating answers given by teacher

Pratham's approach: Makes sense, but will it work?

- At inception, Pratham's approach was a promising *concept*, but couldn't tell if it would work
- Needed evaluation
- Additionally, ultimately want evaluation of *scalable* policies
  - Pratham was initially teaching a small number of kids kids directly
  - Ultimately want to reach all children in India (not necessarily by teaching directly)
  - Scalable policy: potentially reach all children, preferably through government schools and teachers

Outline

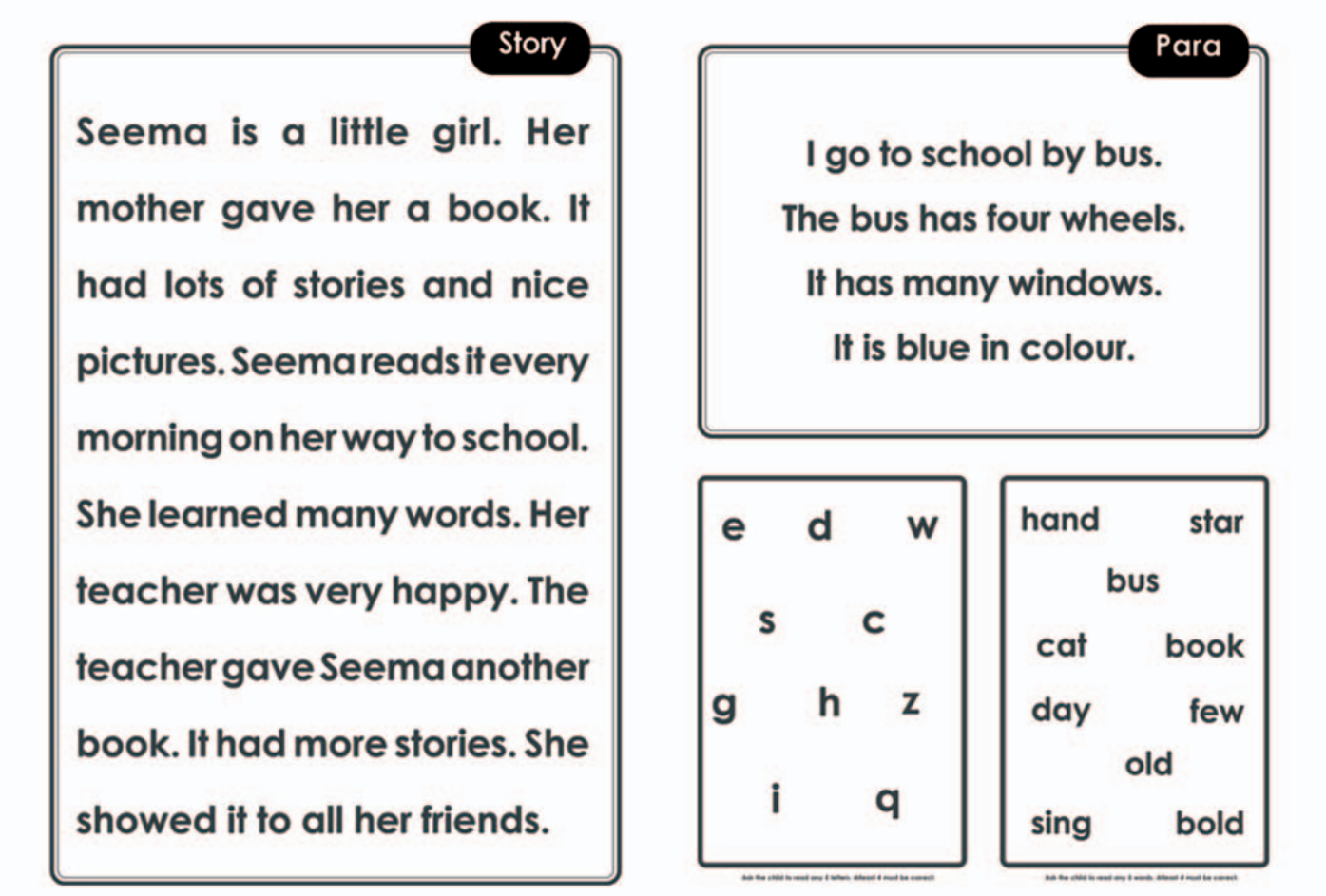
Outline

Proof of concept to scalable policy

- Steps:
  - Diagnose the problem
  - Test "proof-of-concept" of possible solution (might not be scalable)
  - Test scalable policy
- At each step, policy may not be effective
  - Iterate, evaluate again
- To determine next steps, use all the data possible:
  - *impact* evaluation: what are the effects on the outcomes of interest
  - *process* evaluation: whether and how is the program being implemented as intended
  - formal/informal qualitative observations

Outcome: basic language ASER Test

- This presentation: focus primarily on reading



- Actual test is in Hindi or local language
- Most of the interventions targeted math as well

ASER reading Test

- Outcomes measured in levels:
  - 0: can't read letters
  - 1: can read letters
  - 2: can read words
  - 3: can read sentences
  - 4: can read story
- According to government syllabus, levels 1-3 are 1st-grade competencies, level 4 is 2nd-grade

TaRL: Evaluations

All randomized-controlled-trials, varying delivery method (content evolved too)

- Diagnosis / Proof-of-concept (Banerjee, et al. 2007; Banerjee, et al., 2010)
  - Para-teacher: Gujarat / Maharashtra, 2001-2004
  - Volunteer: Uttar Pradesh, 2005-2006
- Scalable policy in schools (Banerjee, et al., 2017)
  - Initial attempts to scale up with teachers: Bihar and Uttarakhand, 2008-2010
  - Second attempt with teachers: Haryana, 2012-2013
  - Mobile team in schools: Uttar Pradesh, 2013-2014

Outline

Diagnosing the problem / Proof of concept

- Initial evaluation took place in cities of Mumbai and Vadodara from 2001-2004 (Banerjee, et al., 2007)
  - Pratham hired and paid a para-teacher ("*balskhi*") in each school for either grade 3 or grade 4.
  - *Balsakhi* teaches reading and math for 2 hours per day (i.e., half of the school day) for the 20 lowest-performing children in each grade.
  - *Balsakhis* recruited from communities near the schools. (*balsakhi* means "child's friend")
  - No tenure, high turnover (but not much firing)

~2004

Balsakhi Program: Results

- Balsakhi Program effective at improving test scores (math as well as language)
  - ~0.28 standard deviations
  - Represents about 1/3 of the improvement over the course of a year in the control group
- Effects concentrated on initially lowest performing kids
- Open questions: what was really causing the impacts?
- *Balsakhi* grouped kids by level and focused on basic skills (by teaching those who were lagging behind)
- But effects could have been driven by other things:
  - Smaller class size?
  - Characteristics of teacher (e.g., social distance, accountability)?

In the meantime...

- Other research supports idea that alignment of teaching and learning levels is a core issue
  - "Grade-level" text books in Kenya only effective for very top students (Glewwe, Kremer and Moulin, 2007)
  - "Tracking" in Kenya effective (Duflo, Dupas, Kremer, 2011)

Proof of concept–II

- From Pratham's standpoint, the problem with the *balsakhi* program was that it was not feasible to scale
- In mid-2000s, Pratham shifted its implementation model to village-based volunteers
- Second evaluation was done in Uttar Pradesh in 2005-2006 (Banerjee, et al., 2010)
- 280 communities (65 treatment, 85 control)
- Children aged 6-14 (grades K-9)
- Pratham's method was still relatively untested at this point. Would previous results hold under:
  - Change in context (urban slums to rural villages)
  - Change in implementation (paid para-teachers to unpaid volunteers)

Proof of concept–II

- Results:
  - 7.7 % of kids saw volunteer
  - Treatment group improved by about 0.08 levels relative to control
  - This is large given low takeup–implies an improvement of nearly 1 whole level for those who saw the volunteer
- Interpretation: methodology effective and can be implemented effectively by volunteer under NGO supervision
  - Survived change in context (urban slums to rural villages)
  - Survived change in implementation (paid para-teachers to unpaid volunteers)

Summing up so far

- Balsakhi evaluation helped diagnose the problem and showed that the initial iteration of TaRL was effective
- Uttar Pradesh evaluation showed that methodology worked in volunteers, rather than paid staff, and in a different context
- Next step: Scalable policy in schools

Outline

Three Attempts to Integrate Policy into Schools

- Diagnosis / Proof-of-concept (Banerjee, et al. 2007; Banerjee, et al., 2010)
  - Para-teacher: Gujarat / Maharashtra, 2001-2004
  - Volunteer: Uttar Pradesh, 2005-2006
- Scalable policy in schools (Banerjee, et al., 2017)
  - Initial attempts to scale up with teachers: Bihar and Uttarakhand, 2008-2010
  - Second attempt with teachers: Haryana, 2012-2013
  - Mobile team in schools: Uttar Pradesh, 2013-2014

School Teacher / Volunteer—Bihar and Uttarakhand

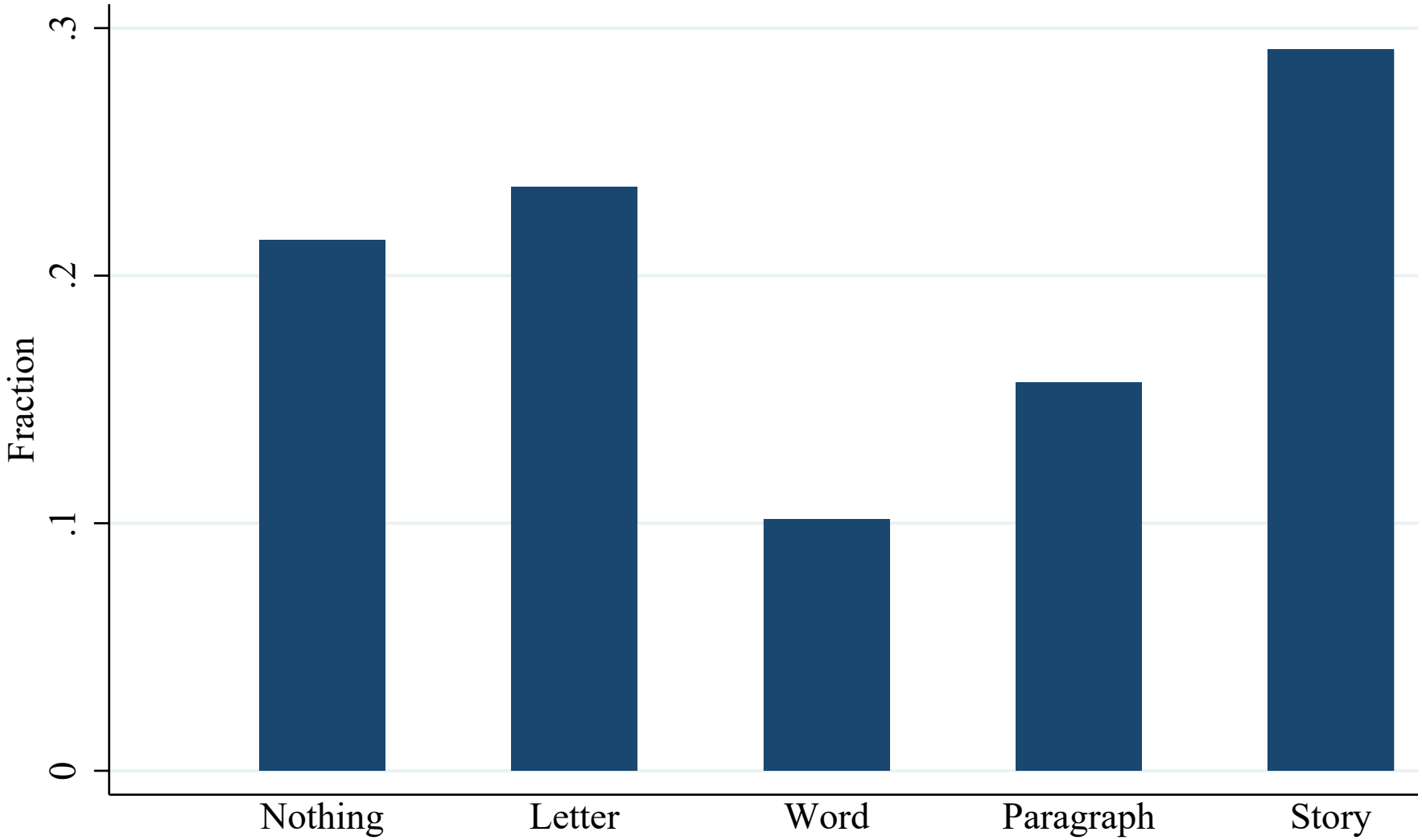
- Volunteer teaching Pratham methodology was very effective
- Problem: only 8% of kids saw the volunteer
- Also, Pratham was worried about creating a parallel schooling system that still wasn't fully scalable
- New model: Implement in schools, using existing schoolteachers to teach it

School Teacher / Volunteer—Bihar and Uttarakhand

- All interventions centered around schools, with teachers as implementers
- Main objective: Test whether teachers can effectively implement Pratham methodology
- 2008-2010: School-year interventions:
  - Bihar: 264 schools, grades 1-5
  - Uttarakhand: 122 schools, grades 1-5

Baseline Level

Bihar, Before Summer Camp



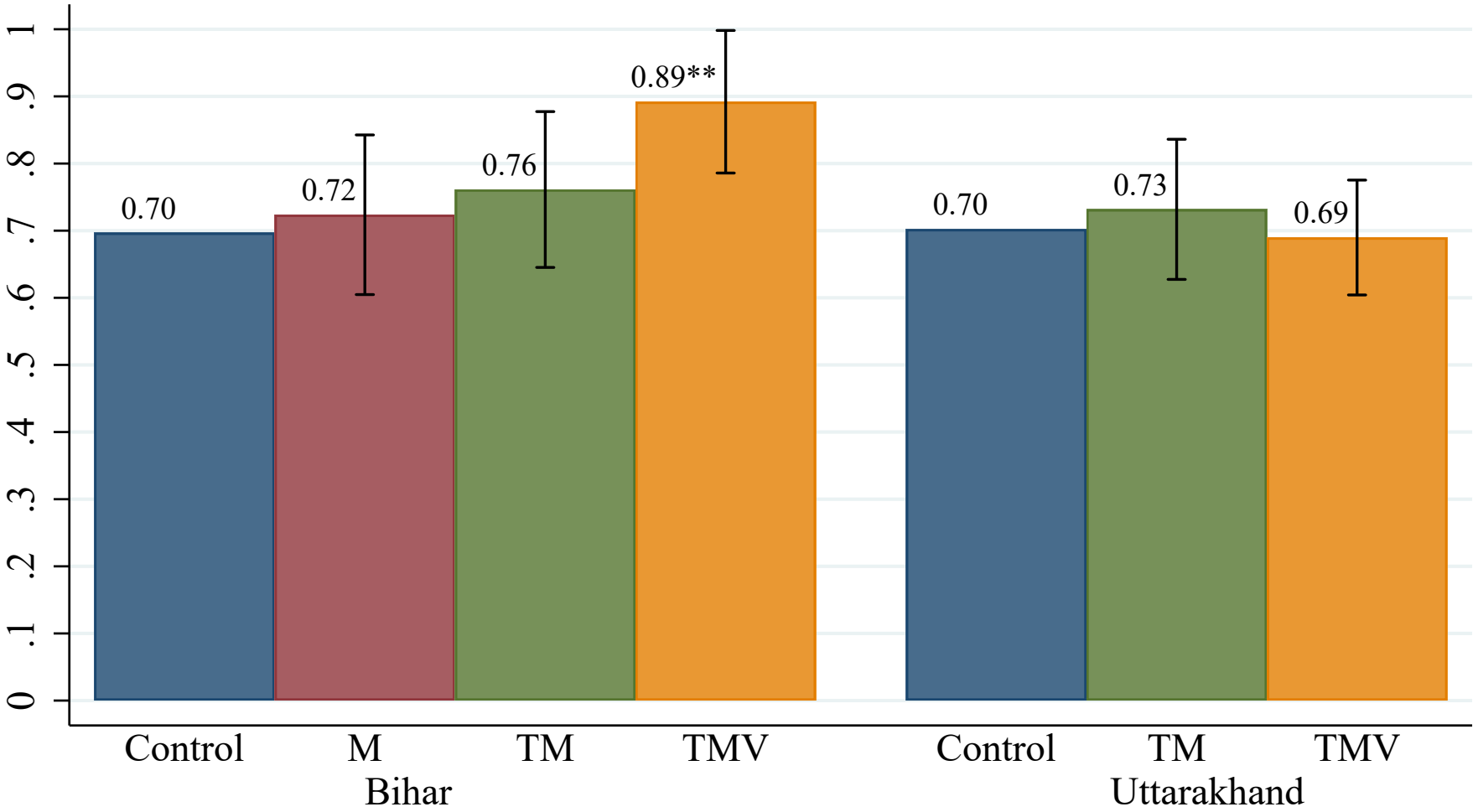
Average = 2.07

Bihar/Uttarakhand School Year Interventions

- Interventions centered around schools, with teachers as implemeters
- Main objective: Test whether teachers can implement Pratham methodology
- Secondary objective: Test the types of support teachers might need to do this
- Bihar: 264 schools, grades 1-5
  - Control
  - Materials only (M)
  - Training and materials (TM)
  - Training, materials, and volunteer (TMV)
- Uttarakhand: 122 schools, grades 1-5
  - Control
  - Training and materials (TM)
  - Training, materials, and volunteer (TMV)

Change in reading levels, baseline to endline

Bihar and Uttarakhand



Whiskers: 95 percent confidence interval of difference from control
**: Difference from control significant at 5 percent

Selected Process Results--Bihar and Uttarakhand

	Percent of Schools (# of schools in parentheses)		
	Teachers Trained	Pratham materials used	Classes grouped by ability
A. Bihar — School Year			
Control	1.4	0.8	0.0
	(63)	(59)	(60)
Materials	5.6	33.6	1.6
	(64)	(63)	(63)
Training, Materials	84.4	62.5	3.8
	(66)	(64)	(65)
Training, Materials, Volunteer Support	84.7	69.2	0.0
	(68)	(65)	(65)
B. Uttarakhand			
Control	18.9	3.8	14.1
	(41)	(39)	(39)
Training, Materials	29.4	26.3	10.0
	(40)	(40)	(40)
Training, Materials, Volunteer Support	53.8	38.5	5.1
	(39)	(39)	(39)

Results–Bihar and Uttarakhand

- Main observation from process data: teachers never implemented the methodology
  - Materials; Training and Materials not effective
- Training, Materials, and Volunteer effective in effective in Bihar; not in Uttarakhand
  - Bihar: Volunteers were teaching outside of schools, so this doesn't say much about the teachers
  - Uttarakhand: Volunteers were teaching inside of school; from process monitoring / qualitative data, they didn't have much support within the school; either took took over for slacking regular teachers, or never showed up
- Although state governments supported the programs, they did nothing to support the teachers once they were trained
- Conjecture: need more administrative support for pedagogy to be effective if taught by teachers

School Teacher—Haryana

- , 2012-2013 school year, 300 Schools, grades 2-5
  - Control
  - Training and Materials for teachers

Differences between BH/UK and HR TM Interventions—Monitoring

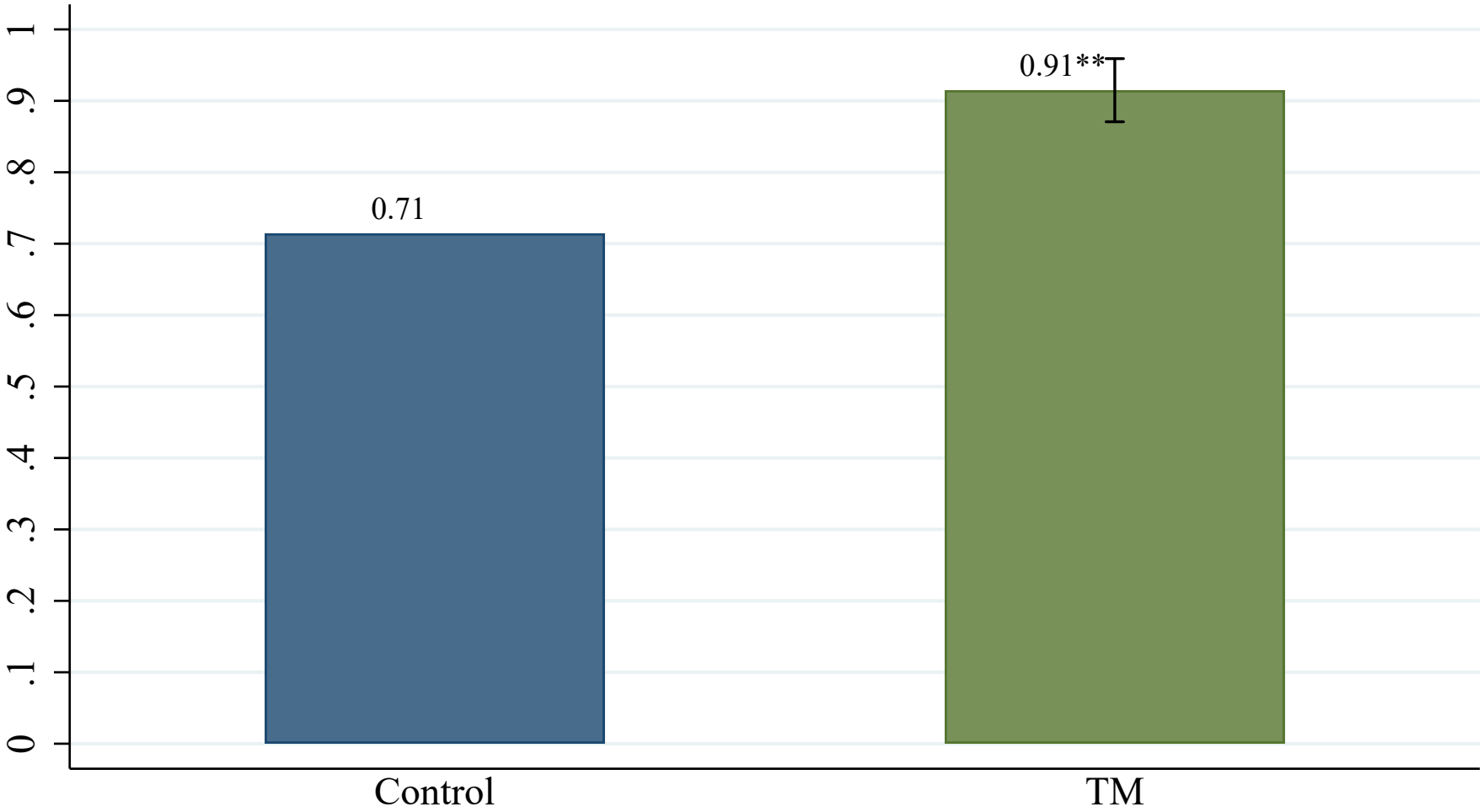
- Big difference between BH/UK and HR TM Interventions—Monitoring and Support
  - Assistant Block Resource Coordinators (ABRCs):
    - Supposed to monitor schools and mentor teachers
    - In actuality, visit schools infrequently to check the mid-day meal and physical infrastructure
  - Intervention taught the ABRCs better monitoring practices
    - ABRCs monitored in both treatment and control schools
    - Take very detailed school/classroom observations (e.g., observing a class) and discuss with both teacher and headmaster
    - Answered questions about TaRL

Differences between BH/UK and HR TM Interventions—Other

- Difference in TaRL
  - more explicit instructions to divide students according to learning level in Haryana
- Difference in time allotted to TaRL
  - In Haryana, intervention corresponded to an expansion of school day

Change in reading levels, baseline to endline

Haryana



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Selected Process Results--Haryana

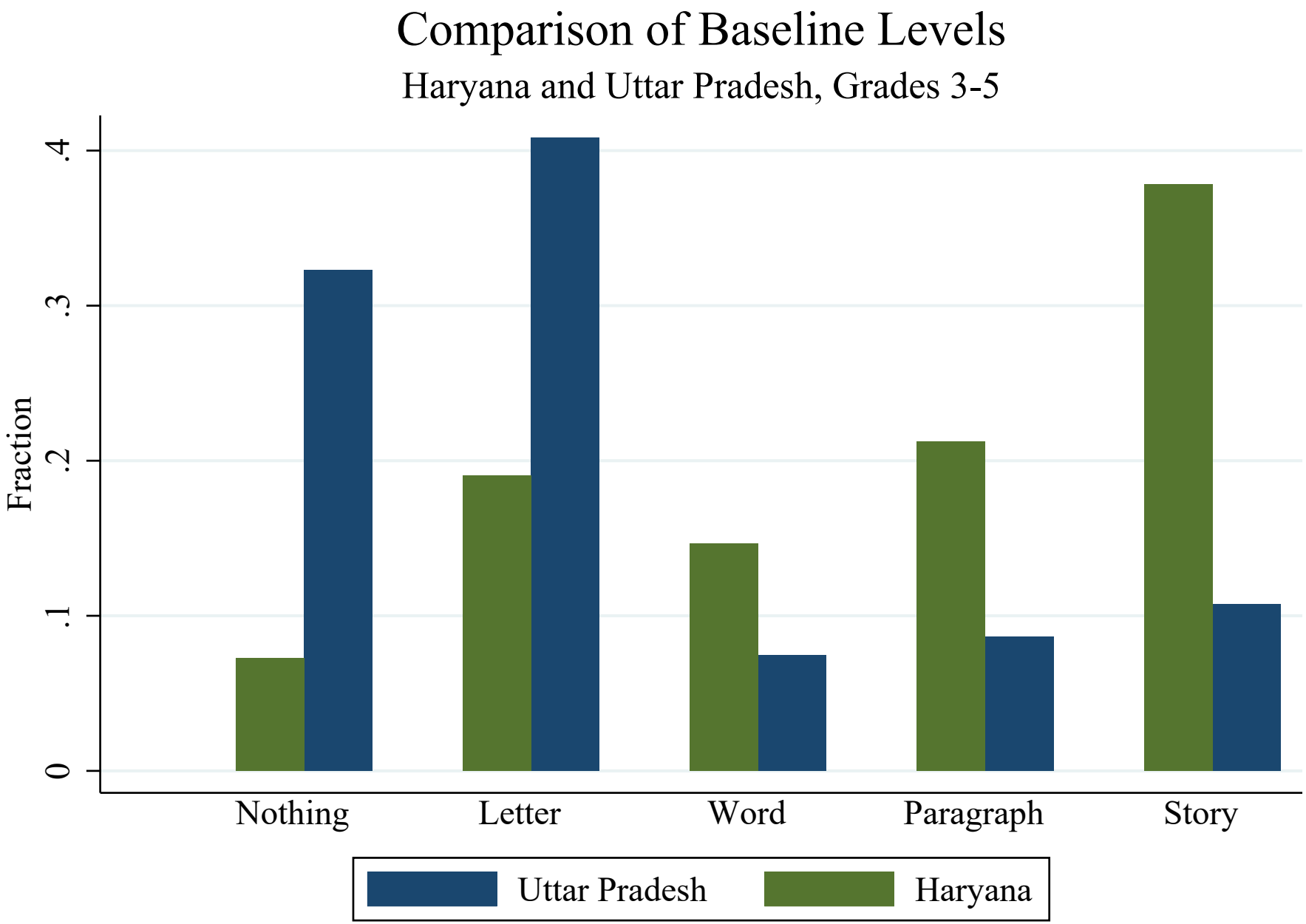
	Percent of Schools (# of schools in parentheses)		
	Teachers Trained	Pratham materials used	Classes grouped by ability
Control	0.5	0.5	0.0
	(200)	(199)	(199)
Teaching at the Right Level	94.7	81.0	91.3
(During TaRL classes)	(126)	(126)	(126)
Teaching at the Right Level (Other times)	94.0	1.3	2.0
	(155)	(149)	(149)

Results—Haryana

- Process monitoring:
  - Teachers adopted pedagogy, when they hadn't in Bihar / Uttarakhand
  - Other process monitoring results: ABRCs made school visits and provided support to teachers
- Interpretation: extra top-down monitoring / administrative helped overcome implementation challenge

Mobile Team Model—Uttar Pradesh

- Uttar Pradesh learning levels in primary school are among the worst in the country (ASER, 2017)


Comparison of Baseline Levels
Haryana and Uttar Pradesh, Grades 3-5
Fraction
0
.1
.2
.3
.4
Nothing
Letter
Word
Paragraph
Story
Uttar Pradesh
Haryana

Mobile Team/Camps Model—Uttar Pradesh

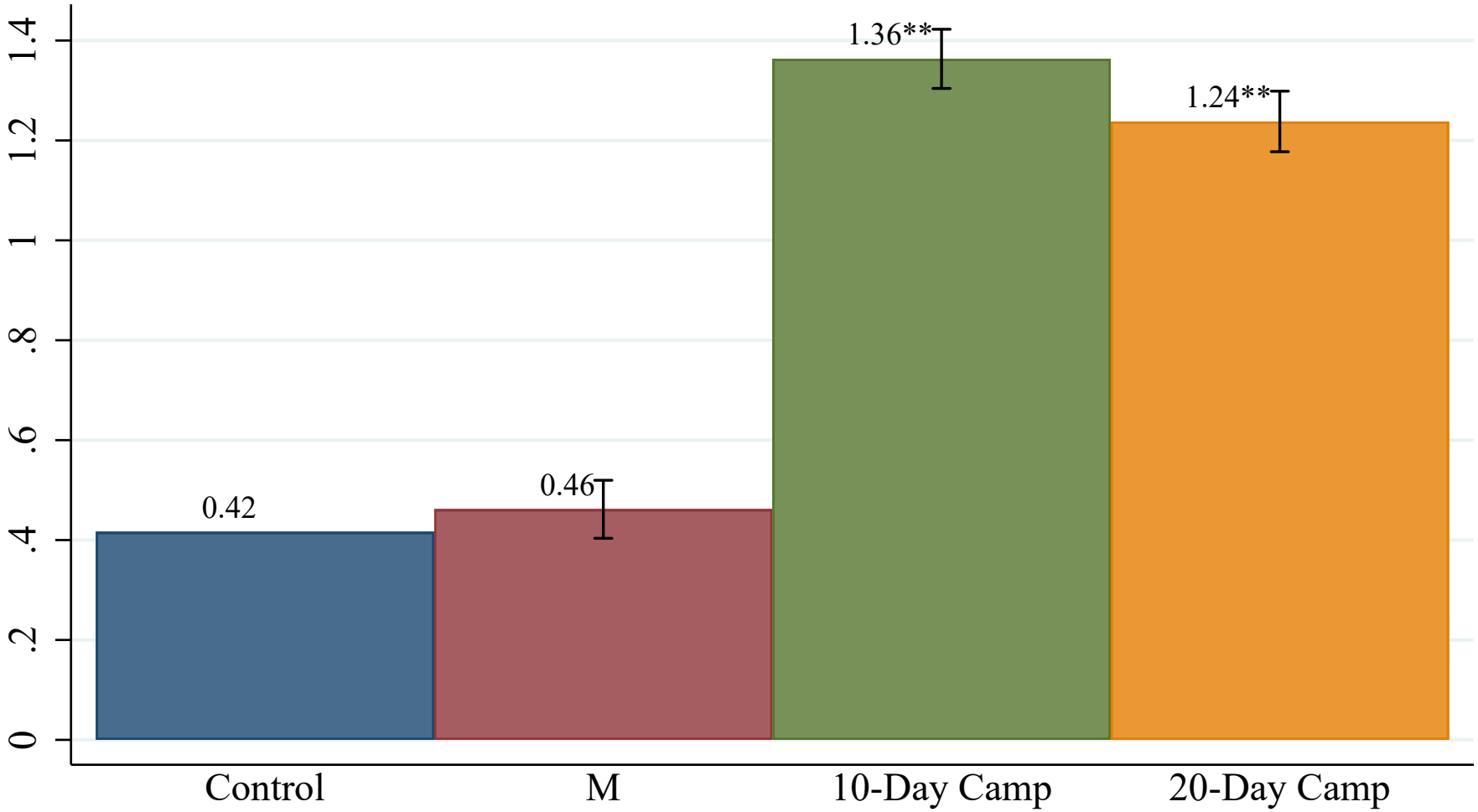
- Not much potential for government-led monitoring → organizational change / teacher implementation harder in this context
- But don't want NGOs to substitute for schools
- Potential solution: Pratham provides enough volunteers and staff to teach the entire school using TaRL method, but for a limited number of school days per year
- Clearly a tradeoff:
  - not a "hands off" approach, but:
  - most of the time children are being taught by regular teachers
  - can reach lots of children through schools

Uttar Pradesh—evaluation design

- 480 schools
  - Control
  - Materials only
  - Camps:
    - 10-day camp: Pratham teaches in schools in four 10-day bursts
    - 20-day camp: Pratham teaches in schools in two 20-day bursts
    - Each contains a "refresher" of 10 days during the summer
    - Note that this is still only 50 days of supplemental teaching (relative to school calendar of 200+ days)
    - Tradeoff: "Heavy" intervention with lots of NGO resources, but short duration and (hopefully) good implementation

Change in reading levels, baseline to endline

Uttar Pradesh



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Selected Process Results--Uttar Pradesh Camps

	Percent of Schools (# of schools in parentheses)		
	Pratham teachers trained	Pratham materials used	Classes grouped by ability during camps
Control		0.0	
		(108)	
Materials		30.7	
		(111)	
10-Day Camps	89.9	90.6	79.4
	(122)	(122)	(122)
20-Day Camps	87.8	84.2	83.5
	(120)	(120)	(120)

Results—Uttar Pradesh

- Interpretation: mobile team model can be effective where school / management processes are completely broken

Outline

Wrapping up–TaRL in India

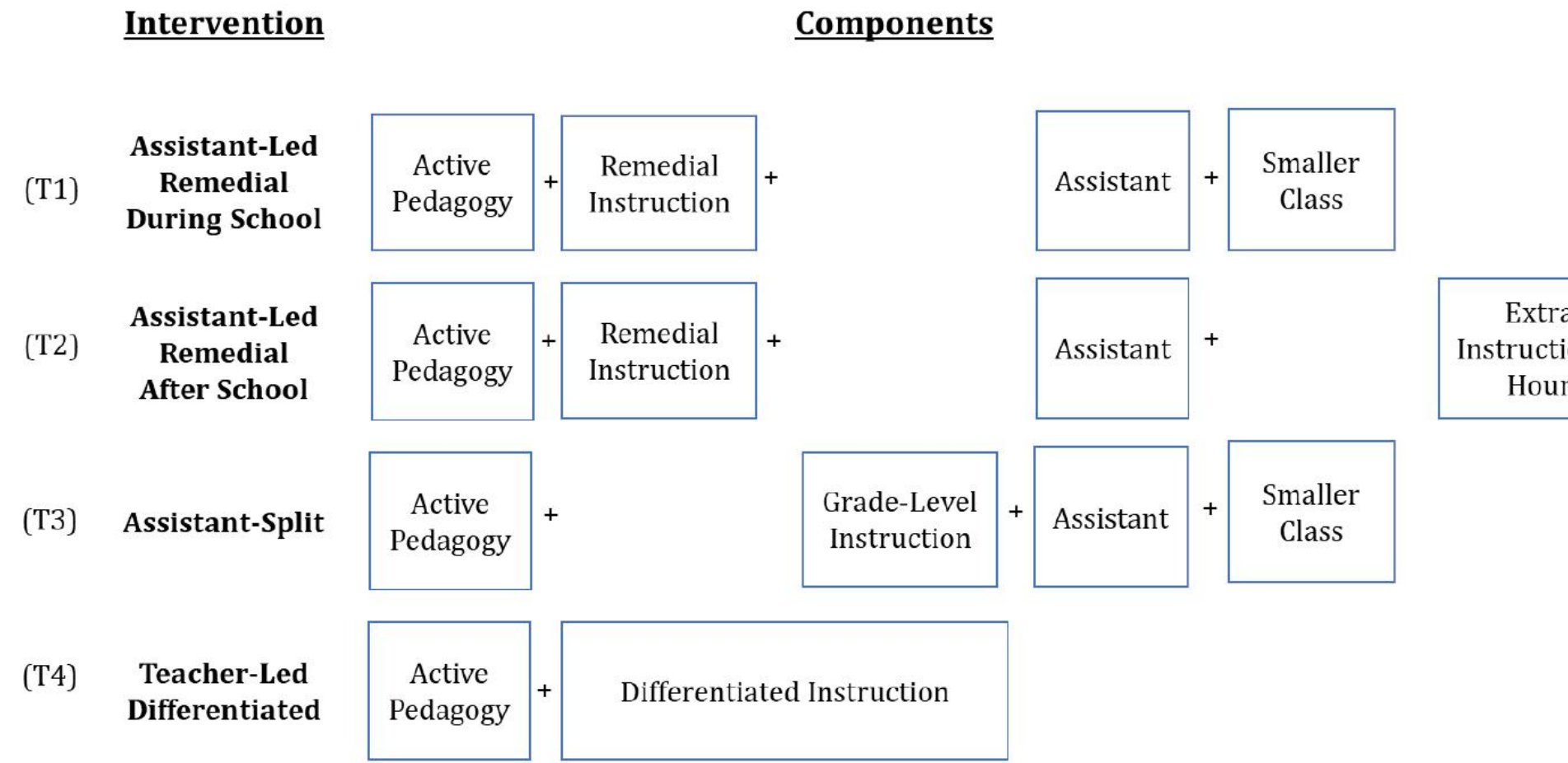
- Teaching at the Right Level started with two initial proof-of-concept "successes" in Vadodara/Mumbai and in Uttar Pradesh
- From there, it took 4+ RCTs over 10+ years to move from concept to scalable policy
  - Initial attempts to scale up with teachers: Bihar and Uttarakhand, 2008-2010
  - Second attempt with teachers: Haryana, 2012-2013
  - Mobile team in schools: Uttar Pradesh, 2013-2014

TaRL in Ghana–I (Duflo, Kiessel, and Lucas (2021)

- In 2010-2013, Government of Ghana implemented several TaRL and partnered with Innovations for Poverty Action on an RCT
  - 500 (!) schools, 4 treatment arms
  - Key questions were how to use assistants and how to split classes

TaRL in Ghana–I (Duflo, Kiessel, and Lucas (2021)

Figure 1: Intervention Components and Graphical Conceptual Framework



TaRL in Ghana–I (Duflo, Kiessel, and Lucas (2021)

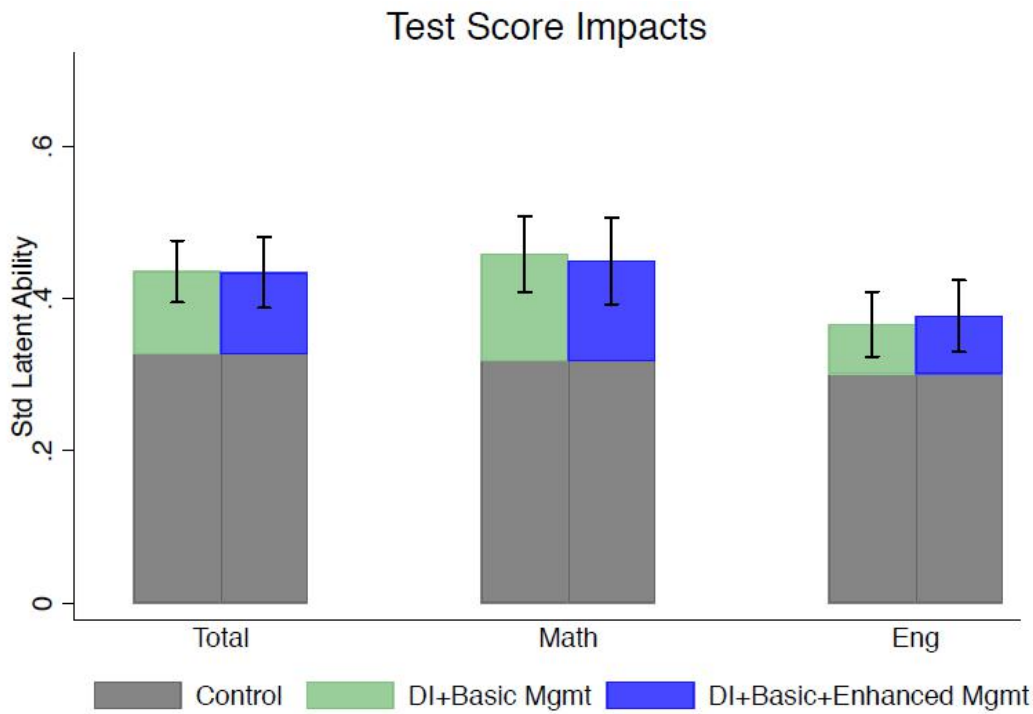
Table 1: Achievement in Math and English

		Exposed Grades 1-3				Exposed Grades 2-3, Tested in Grade 4	
		All Questions		Foundational Questions		All Questions	Grade 1-3 Questions
		Grade 2 (1)	Grade 3 (2)	Grade 2 (3)	Grade 3 (4)	(5)	(6)
(1)	Assistant Led Remedial, During School	0.096**	0.140***	0.120***	0.147***	0.071	0.102**
		(0.039)	(0.046)	(0.038)	(0.047)	(0.044)	(0.042)
(2)	Assistant Led Remedial, After School	0.101**	0.147***	0.139***	0.159***	0.084*	0.114***
		(0.042)	(0.045)	(0.039)	(0.045)	(0.045)	(0.043)
(3)	Assistant Split	0.042	0.080*	0.054	0.072*	0.116**	0.133***
		(0.041)	(0.043)	(0.037)	(0.043)	(0.047)	(0.046)
(4)	Teacher Led Differentiated Instruction	0.052	0.076*	0.092**	0.125***	0.013	0.052
		(0.043)	(0.045)	(0.040)	(0.043)	(0.047)	(0.046)

- Implementation (teacher or assistant teaching to targeted group) strongest in Treatments 1 and 2

TaRL in Ghana–II (Beg, Fitzpatrick, and Lucas, 2022)

- Second partnership with Government of Ghana to train managers and teachers
- 2018-19 school year
- Goal was to integrate differentiated instruction into schools and ensure good implementation
- 210 treatment schools, 2 treatment arms:
  - T1: Training teachers and managers in differentiated instruction as well as basic management practices for managers
  - T2: Additional people management training for managers



- ~.11 Standard deviations, similar impacts for both treatment arms
- Equally strong implementation of differentiated instruction in both treatment arms

General Lessons

- Initial proof-of-concept experiments with NGOs don't necessarily provide impact estimates of policy when implemented on large scale by governments (as seen from Bihar and Uttarakhand)
- Important to understand mechanisms and functioning of the government as an organization
- Process is iterative, and each iteration can experiment with both the intervention and with the method of implementation
- Can learn from failures as well as successes
- Impact estimates are important but descriptive and process data can also provide crucial information

Thank you!

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