

# Stratified Society and Segmented Schools: The Effect on Children's Learning

Abhijit Visaria and Minseop Kim, University of Pennsylvania

## Introduction

The education sector in India in the past two decades has seen improved geographic access to schools and near-universal primary school enrolment. However, concerns persist regarding the inadequate quality of teaching and low levels of children's learning. Research indicates that children from disadvantaged social and economic groups are less likely to have access to learning resources and enabling environments. Previous studies have noted that there is a rising perception among parents that the quality of education in private or English-medium schools is better than in government schools, and enrollment in them has increased rapidly in both urban and rural areas. Since 2005, mid-day meals have been introduced in government primary schools with the objective of improving retention and children's learning achievements, while also seeking to impact their nutritional status.

We examine the relationship between children's reading and math abilities and institutional characteristics of schools: private or government-run, medium of instruction and provision of mid-day meals, while also accounting for socioeconomic differences.

## Research Questions

Do children enrolled in private or English-medium schools at ages 8-11 perform better in reading and math than children in government or vernacular-medium schools?

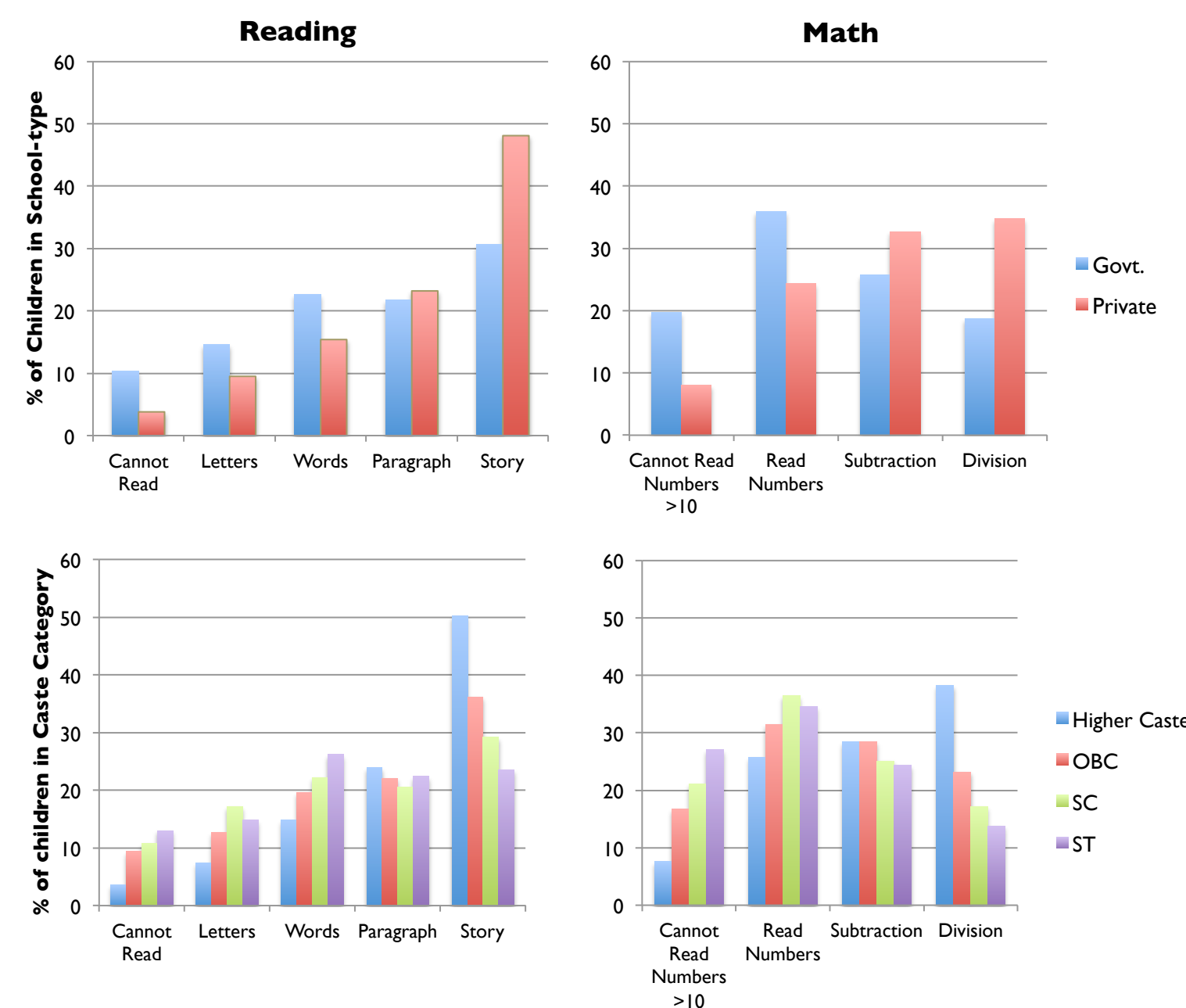
Do mid-day meals provided by the school improve learning achievements of children in primary schools?

Do differences exist in the effect of school characteristics and socioeconomic variables at different levels of reading and math learning?

## Data

We use data from the India Human Development Survey (IHDS), conducted in 2004-05 jointly by the University of Maryland, College Park and the National Council of Applied Economic Research, New Delhi. The IHDS is a nationally-representative survey of 41,554 households across 1503 rural and 971 urban locations across India. Our sample includes 17,061 children aged 8-11 for whom the IHDS conducted curriculum- and language-appropriate assessments of their reading and math abilities.

Descriptives	% / Mean	SD
Age	9.5	1.1
Grade	3.1	1.5
<b>Sex</b>		
Female	52.4	
Male	47.6	
Education level of highest educated female in household	3.8	4.6
Education level of highest educated male in household	6.3	4.9
Household assets (30-point scale)	11.4	5.9
<b>Caste</b>		
Higher caste	23.7	
OBC	40.4	
Scheduled caste	26.4	
Scheduled tribe	9.4	
<b>School Type</b>		
Government	66.7	
Private	33.3	
<b>Medium of Instruction</b>		
Hindi / State Language	84.0	
English	12.1	
Other	3.9	
Mid-day Meal	53.4	
Private Tuition	16.6	



## Methods

We employ the continuation ratio model to account for an advancement of learning stages in reading and math and use cluster-level fixed effects regression to address potential homogeneity at the level of the primary sampling unit.

$$\log \frac{A_{ij}}{1 - A_{ij}} = \alpha_j + \beta X_i \quad j = 1, 2, \dots, J - 1$$

where  $A_{ij} = \Pr(y_i > j | y_i \geq j)$  and  $\beta X_i = \beta_1 x_{i1} + \dots + \beta_k x_{ik}$

In addition, given significant interaction effects between predictors and learning stages, we estimate fixed effects logistic regression models for each reading and math learning stage.

## Results

	Reading		Math	
	OR	SE	OR	SE
Age	1.18**	0.03	1.16**	0.03
Grade	1.74**	0.03	1.72**	0.03
Female (Ref. = Male)	0.85**	0.03	0.77**	0.03
Education of highest educated female in household	1.03**	0.01	1.04**	0.01
Education of highest educated male in household	1.03**	0.01	1.03**	0.01
Income (log)	1.01	0.01	1.00	0.01
Household assets	1.04**	0.01	1.05**	0.01
<b>Caste</b> (Ref. = Higher caste)				
OBC	0.84**	0.06	0.86*	0.06
Scheduled caste	0.67**	0.05	0.66**	0.05
Scheduled tribe	0.63**	0.07	0.80	0.10
Distance	1.02	0.01	1.01	0.01
Private school (Ref. = Government school)	1.79**	0.13	1.85**	0.13
<b>Medium</b> (Ref. = Hindi / state language)				
English	0.77*	0.08	0.81*	0.08
Other	1.23	0.27	1.05	0.23
Mid-day Meal	0.83**	0.05	0.91	0.06
Private Tuition	1.19*	0.08	1.37**	0.10
Log likelihood	-8252.36		-7079.71	

	Advancement from			
	Cannot Read	Letters	Words	Paragraph
Age	1.23**	1.12*	1.22*	1.21*
Grade	1.78**	1.69**	1.89**	1.46**
Female (Ref. = Male)	0.78*	0.83*	0.96	0.86
Education of highest educated female in household	1.03*	1.04**	1.01	1.03*
Education of highest educated male in household	1.04	1.05*	1.03*	1.03*
Household assets	1.07**	1.04*	1.05**	0.99
<b>Caste</b> (Ref. = Higher caste)				
OBC	0.69	0.74*	0.84	0.98
Scheduled caste	0.65	0.54**	0.67**	0.83
Scheduled tribe	0.66	0.83	0.58*	0.63*
Distance	1.05	0.99	1.02	1.04
<b>School Type</b>				
Private (Ref. = Government)	2.46**	1.43*	1.87**	1.41*
<b>Medium of Instruction</b> (Ref. = Hindi / state language)				
English	1.14	1.23	0.50**	0.89
Other	3.44	1.61	0.49	1.62
<b>Mid-day Meal</b>	1.09	0.78	0.87	0.72*
<b>Private Tuition</b>	2.25**	1.15	1.21	0.89
N	3049	3941	4620	3644
Log Likelihood	-791.543	-1175.44	-1406.86	-1283.45

	Advancement from		
	Cannot Read Numbers >10	Read Numbers	Subtraction
Age	1.16**	1.24**	1.10
Grade	1.62**	1.72**	1.68**
Female (Ref. = Male)	0.61**	0.90	0.92
Education of highest educated female in household	1.03*	1.03**	1.02
Education of highest educated male in household	1.04*	1.05**	1.03
Household assets	1.08**	1.03*	1.03*
<b>Caste</b> (Ref. = Higher caste)			
OBC	0.85	0.90	0.81
Scheduled caste	0.60**	0.63**	0.83
Scheduled tribe	0.75	0.98	0.90
Distance	1.08	0.99	1.01
<b>School Type</b>			
Private (Ref. = Government)	1.89**	2.09**	1.37**
<b>Medium of Instruction</b> (Ref. = Hindi / state language)			
English	1.18	1.03	0.77
Other	0.85	1.26	1.70
<b>Mid-day Meal</b>	1.09	1.03	0.65**
<b>Private Tuition</b>	1.60*	1.34*	1.24
N	4491	5597	3349
Log Likelihood	-1377.62	-1866.52	-1127.18

\* p < 0.5, \*\* p < 0.01.

## Discussion

The results of our study indicate that there is a significant advantage of being in a private school in terms of reading as well as math abilities. This advantage persists at all levels of advancement from no or little ability to the highest measured ability. Overall, children in English-medium schools are worse off, while the provision of mid-day meals has little effect.

Private tuition may have emerged as a key strategy to compensate for the poor quality or absence of teaching in school. Private tutoring for language may be an exception at these early grades, and it is effective only for children to be able to advance from having no reading ability. On the other hand, while children receiving private tutoring are better at recognizing numbers and doing subtractions, they are not better at divisions.

Girls, who do worse than boys at early levels, are catching up and no longer worse off at more complex reading and math abilities. Our study confirms that even after accounting for sex, grade completion, household assets, as well as school characteristics, children from disadvantaged social groups are performing worse off in schools.

## References

- Allison, P. 1999. *Logistic Regression using SAS: Theory and Application*. Cary, NC: SAS Institute.
- De, A., M. Majumdar, C. Noronha & M. Samson. 2002. "Private Schools and Universal Elementary Education." in *India Education Report*, edited by R. Govinda. New Delhi: Oxford University Press.
- Desai, S., C. D. Adams & A. Dubey. 2009. "Segmented Schooling: Inequalities in Primary Education." in *Blocked by Caste: Discrimination and Social Exclusion in Modern India*, edited by S. Thorat & K. Newman. New Delhi: Oxford University Press.
- Ramachandran, Vimala. 2002. *Gender and Social Equity in Primary Education: Hierarchies of Access*. New Delhi: Sage Publications.

